RIL 30, 1951

STEEL

The Weekly Magazine of Metalworking

APR 3 0 1951

HOW A SMALL INDUSTRY IS LICKING

Materials Problems

—on page 34

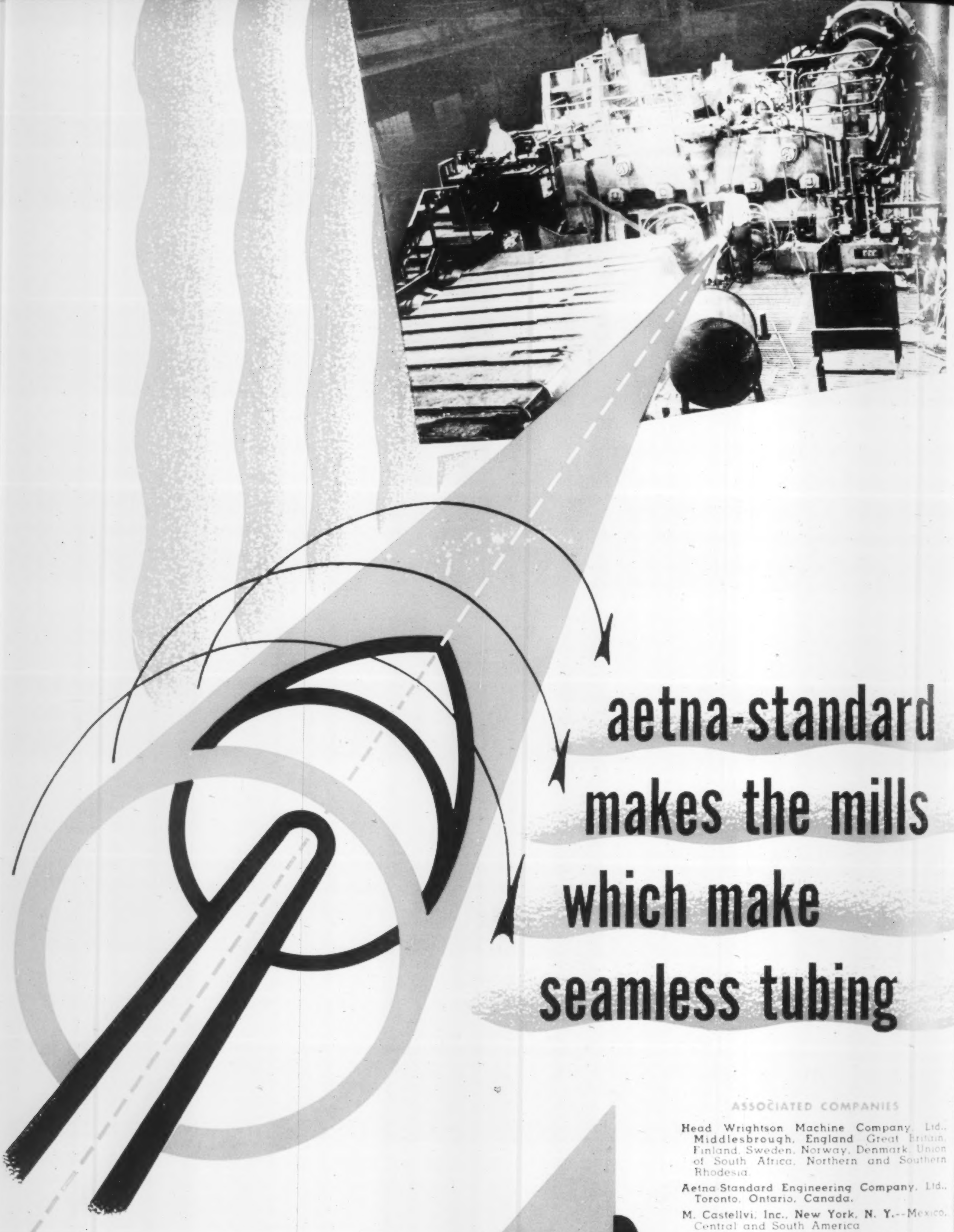
PARTS FOR WAR
PARTS FOR PEACE

26th Annual Financial Analysis of the Steel Industry (facing p. 32)

What's Behind Embrittlement of Stainless Turbine Steels, p. 54

Modernized Foundry Yields More Gray Iron, p. 60

CONTENTS — PAGE 5



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STEEL
The Weekly Magazine of Metalworking

VOL. 128 NO. 18 APRIL 30, 1951

THIS WEEK IN METALWORKING

NEWS

Behind the Scenes 6
Letters to the Editors 12
The Metalworking Outlook 17
As the Editor Views the News 21
The Metalworking Contract Summary 32
Checklist on Controls 33
How a Small Industry Is Licking Materials Problems 34
Windows of Washington 36
Mirrors of Motordom 39
The Business Trend 43
Men of Industry 47
Obituaries 51

SPECIAL REPORT

Financial Summary of Steel Industry for 1950 Following 32

PRODUCTION-ENGINEERING

Production and Engineering News at a Glance 53
Embrittling Effect of Steam on Stainless at Elevated Temperatures 54
Seen and Heard in the Machinery Field 58
Improved Handling Methods Facilitate Chain Production 59
Foundry Modernization Expands Gray Iron Casting Capacity 60
Open Hearth Furnaces "Jet Tapped" in 30 Seconds 64
Progress in Steelmaking—Continuous Annealing . . . Arousing Industry Interest 68
Proper Design Improves Defense Material Efficiency 77
Calendar of Meetings 87
New Products and Equipment 89

MARKETS

The Market Outlook 99
Metal Prices and Composites 100
Nonferrous Metals 104
Metalworking Briefs 121

Editorial and Business Staff—Page 10. Advertising Index—Page 128. Editorial index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

Next Week **. . . For Best Forming Results Use the Right Lubricant . . . Welded Differential Housing 20 Per Cent Lighter . . . Correct Mounting Methods Eliminate Grinding Wheel Breakage . . . Zebra Type Open-Hearth Roof Steps Up Heats Per Campaign**

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Single copies (current issues) 35 cents. Metalworking Yearbook issue $2.00. Entered as second class matter at the postoffice in Cleveland, under the Act of March 3, 1879. Copyright 1951 by Penton Publishing Co.

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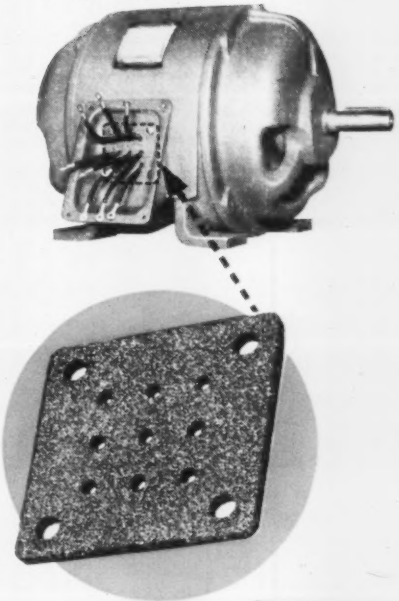

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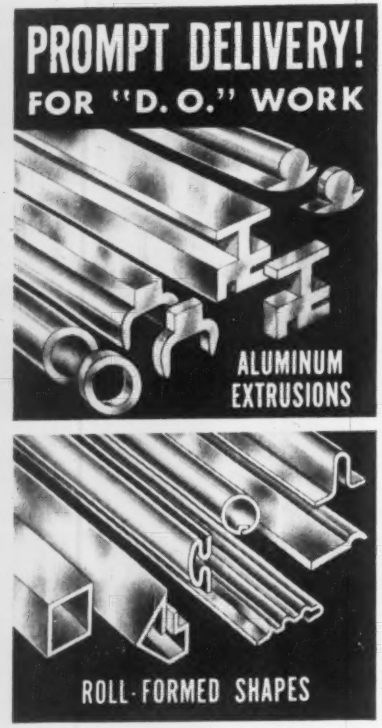

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Behind the Scenes . . .

Finances

Associate Editor Vance Bell and Assistant Editor Sam Baker were knee-deep in calculating machine tape and questionnaires a while back putting on the final touches to STEEL's 26th annual financial report of the steel industry which appears as a pull-out insert in this issue.

The summary gives you accurate, complete information obtainable no where else—far more than just the data found in steel companies' annual reports. Producers turning out more than 90 per cent of all the steel produced in this country are represented.

Included this year are three steelmakers who have never before participated: Kaiser Steel Corp., Detroit Steel Corp. and McLouth Steel Corp.

A Poke at Coke

In our Apr. 2 column, we used the word "Coke," but, alas, we spelled it with a small c. We have been informed forcefully—that Coke must always be spelled with a cap c when referring to a beverage. The Coca-Cola people have the word all sewed up in copyrights. We are informed that they are a little unhappy about the slipshod manner in which writers are writing Coke and have even been running ads lately which emphasize that Coke is not a generic term but refers specifically to their product.

It strikes us that this whole situation is loaded with ironic implications. For years, Coca-Cola people have advertised so well that they have made coke a generic term, no matter what their legal copyrights and sales messages say. Now they have to turn around and try to unadvertise the universality of the word "Coke." We don't think they'll succeed.

Lucky Friday the 13th

Friday, Apr. 13, was a lucky day for the editors, for they got a chance both to write some important metalworking news and to distribute it in advance. You may remember that was the day when the news on the Controlled Materials Plan first broke. The editors got advance information on the matter from our Washington man, Ed Kruetzberg, worked up a comprehensive story that was on the presses for page 43 of the Apr. 16 issue by Apr. 13.

That evening a Priorities and Allocations Clinic sponsored by Cleveland Engineering Society was being held and about 300 preprints of our article were taken out to the forum by Associate Editor Vance Bell.

The preprints were only a few hours old and the first material in black and white on the subject available to those men at the meeting who almost stampeded to get their copies.

Honored

Machine Tool Editor Guy Hubbard was honored *in absentia* by Westinghouse Electric Corp. at the company's annual machine tool electrification forum a while back. Guy, who had been ill just before the meeting, had to miss a few of the sessions while he rested in his hotel room. At one of them he was presented with a radio in honor of his long service in covering the Westinghouse affair for STEEL.

At Last, Women

After four months of editorial front covers, the editors have at last managed to get women into the layout. Always after the comprehensive, the boys upstairs were not satisfied with just one woman on the cover; they got five.

The girls were photographed by Associate Editor Dan Reebel at work on both peace and war jobs at Z & W Machine Products Inc. in Cleveland. Dan also took the photographs used to illustrate the story (p. 34) that was written by Associate Editor John Morgan.

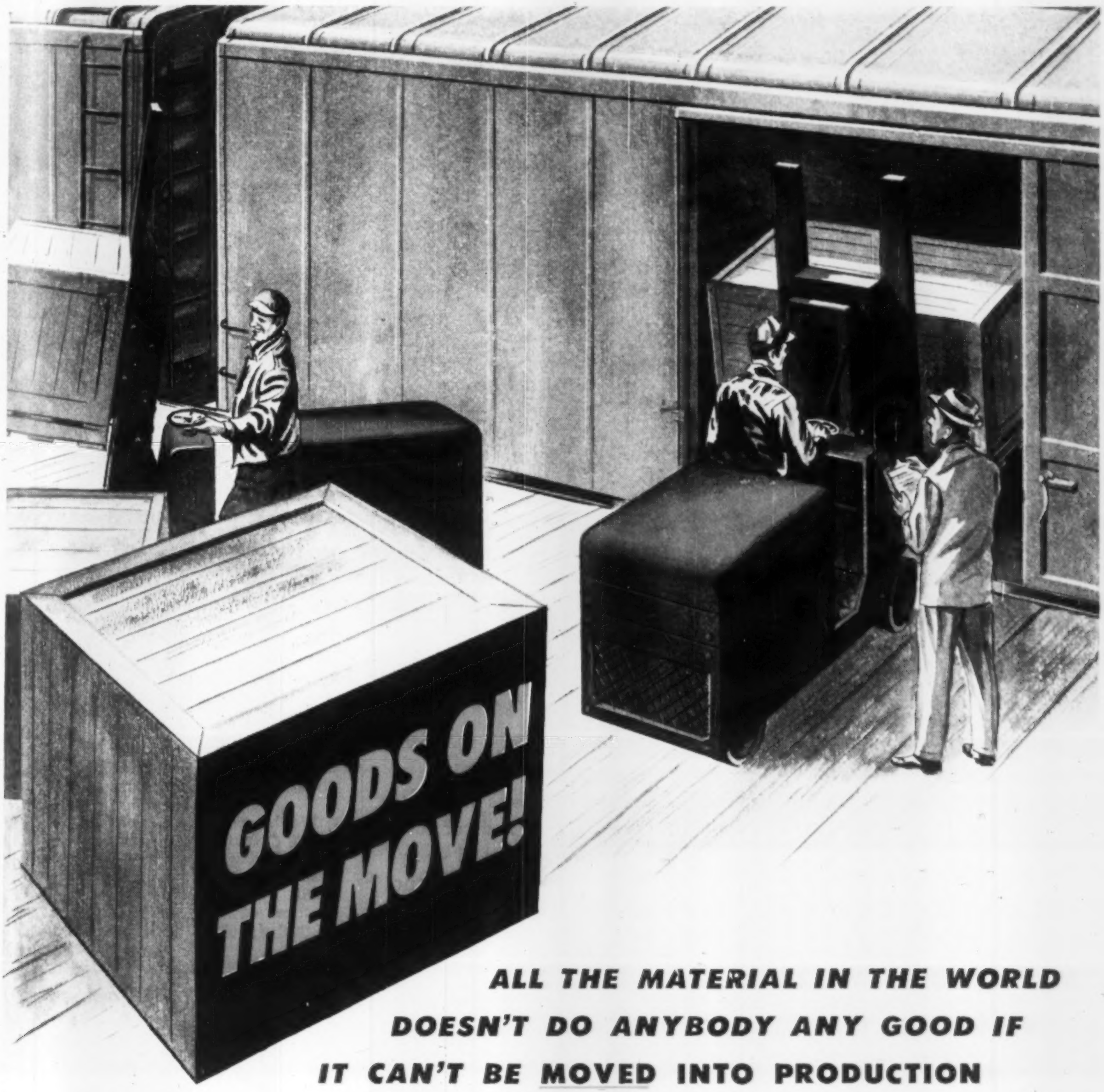
Puzzle Corner

Vern Luft of Raymond Concrete Pile Co. was the first in with the correct answer to the Apr. 16 puzzle. The problem was no problem at all, of course, just a test to see how carefully you read. Both trains would be the same distance from New York when they met.

Mr. Luft submits this one: A jug and a cork cost a dollar and a dime. The jug costs a dollar more than the cork. How much is the cork?

Shrdlu

(Metalworking Outlook—Page 17)


GOODS ON THE MOVE!

ALL THE MATERIAL IN THE WORLD DOESN'T DO ANYBODY ANY GOOD IF IT CAN'T BE MOVED INTO PRODUCTION

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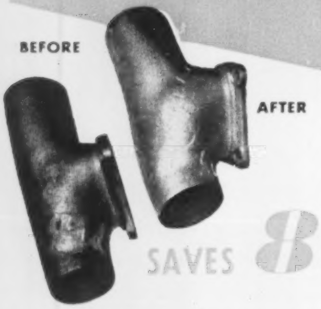

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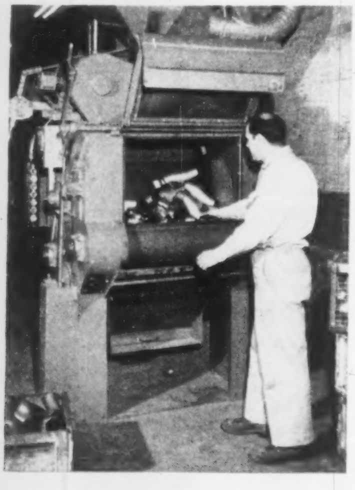

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LETTERS
TO THE EDITORS

Where Credit Is Due

We enjoyed the article based on our installation at Ford ("Small Parts Bore Hardened on Screw Machines") in STEEL, Mar. 26, p. 74. However, we were disappointed to note that you gave no credit to Tocco, although you featured the design of our coil, with a mandrel, —a job which required much engineering on our part.

H. B. Osborne Jr., Technical Director
Tocco Division
The Ohio Crankshaft Co.
Cleveland

• *Omission of credit to Tocco is recognized and* STEEL *herewith offers its apologies.*

Treating Industrial Waste

Your article, "Neutralizing Industrial Waste Liquids," (STEEL, Apr. 9, p. 74) discusses papers presented at the fifth annual Industrial Waste Conference, sponsored by Purdue University and the Indiana State Board of Health. Are these papers available and if so, whom should I contact?

Ralph K. Logan, metallurgist
The Cuyahoga Steel & Wire Co.
Cleveland

• *Address inquiries to M. C. Gillespie, Engineering Extension Service, Purdue University, Lafayette, Ind.*

We have reviewed your excellent article, "Neutralizing Industrial Waste Liquids," in which you make use of descriptive data and photographs supplied by this office. One correction: position of the captions "below" and "right" (p. 74) should be reversed.

Albert Kahn Associated
Architects and Engineers
Detroit

• *Address inquiries to M. C. Gillespie, Engineering Extension Service, Purdue University, Lafayette, Ind.*

Up to Date on NPA's M-7

In the Jan. 22 issue of STEEL, p. 43, you state the manufacture of food processing equipment likely will be allowed as a civilian necessity. NPA Order M-7 lists such equipment, containing aluminum parts, among its prohibited items.

Is there a later amendment to this Order which permits use of aluminum parts necessary in the manufacture of coffee mills, meat grinders and slicers —all very essential pieces of food processing equipment?

C. F. McCrory
Shaker Heights, O.

• *Recent events bear out* STEEL*'s statement of Jan. 22 (" . . . you can relax if you can make something contributing to health, sanitation, food processing or distribution."). Amendment of Apr. 6 to NPA Order M-7 removes aluminum used in the manufacture of food processing equipment from the prohibited list. Announcement of a Controlled Materials Plan to become effective July 1, (*STEEL*, Apr. 16, p. 43) indicates preferred treatment for food products machinery producers in their procurement of aluminum, copper and steel.*

The Metalworking Outlook

Coming Up: Two Big Wage Decisions

The new 18-man Wage Stabilization Board will have to make two major decisions soon. It will have to approve or disapprove of raises granted by meat packers and the woolen industry. Action on those two cases is important because the fate of the whole wage stabilization policy hinges on the new board's judgment. If the increases are approved, wage controls as they're now constituted will go out the window. If the increases are disallowed, the status quo on wage curbs will continue.

Prime vs. Subcontracts

No prime defense contracts are going begging, but small, medium-sized and even large metalworking companies are showing an increasing preference for subcontracts in defense work. The reasons: When you're a sub, primes are more sympathetic and helpful in aiding you to get materials than government agencies; subcontract prices can be more easily adjusted than prime contract prices; the prime contractor's engineers are easier to deal with than government technical people; more paper work is required on primes than on subs.

What To Do About Profits Tax

Watch for amendments to the excess profits law signed Jan. 2, 1951, by President Truman. For that reason, go slow in figuring your tax. But you can do this: Get somebody in your company to study the new law to know generally how you can honestly and legally best take advantage of the alternate methods of figuring your tax as allowed by the measure. Partnerships and proprietorships are not subject to the law, so it would be wise now to decide if you should change your corporate status. In some cases, borrowing may help your excess tax picture. When you have made a general study of the measure, stop and wait for Congress to act.

Quality Control by Decree

Quality control may become a permanent feature in metalworking plants by government decree. The services are insisting that defense prime and sub contractors use it. The Air Force is particularly insistent and expects that its inspection job will be greatly relieved by plant quality control plans. In World War II it used 16,000 inspectors. The Air Force wants to do the inspection task with 5000 this time.

Good Relations with Draft Board

Expect more dealings with your area's draft board as manpower gets tighter and tighter. For successful relations, do this: Know your board well, invite it on a tour through your plant. In presenting your cases, use a man, perhaps a salesman, who knows people. Be honest in seeking deferments. Keep the situation in the hands of local people. Keep records of jobs; know what jobs are vital. Develop a questionnaire and procedure to know the current draft status of every man in your company.

Are Salesmen Necessary?

What to do with your direct salesmen now that sales are so easy to get? Consensus in metalworking: Don't let your sales force wither

Production-Engineering News—p. 53 The Market Outlook—p. 99

on the vine. There's plenty of sales work to do—missionary calls to keep former civilian customers as happy as possible; regular calls to keep up your remaining peace work; and regular calls to prime contractors and government agencies to negotiate defense jobs. Many companies are also returning to the World War II practice of using salesmen as part-time purchasing agents.

Uneasy: Manufacturers Agents

The 3500 commission salesmen and manufacturers' agents in the U.S. may be among the severest casualties of a garrison state economy. Their number declined during World War II and now, wisely or unwisely, some companies are severing relations with the independent salesmen. What's more, the agents on their own accord may have to bow out in increasing numbers soon. They will be subject to renegotiation on defense contracts, while the direct salesmen will not. On that basis, many agents may not be able to compete with direct representatives.

Business Loans Soar

Loan curves are going up, despite a plea by Federal Reserve Board committee that banks and other lending institutions cut down on grants for nondefense expansion. Commercial interest rates are edging upward, and New York banks are fighting to increase their deposits. The V-loan program is bogging down because many banks are reluctant to handle the loans. The plan permits defense producers to use their defense contracts as collateral for a loan. The banks would be assigned repayments from the contracts.

Straws in the Wind

Buick's final assembly of Wright J-65 Sapphire engines will be in a new 1 million-square-foot plant near Willow Springs, Ill.; facility is scheduled for completion early next year . . . Westinghouse expects a $1250 million volume in 1951, compared with about $1 billion in 1950; the company expects a good year in appliances and is going back into manufacture of radio and television tubes . . . William H. Harrison resigned as Defense Production Administrator solely because he had to return to his job as president of American Telephone & Telegraph Co. . . . The government is getting ready to allocate virtually all of the nation's structural steel . . . NPA is also planning for a cutback in the third quarter to 70 per cent of the steel used by makers of consumer durables in the average quarter of the first half of 1950; the second quarter cutback is 80 per cent of that amount.

Here and There in Industry

You can assure yourself of maximum benefits under CMP by getting ready now (p. 25) . . . The new manufacturers' price order is so complicated that it may prove unworkable (p. 26) . . . Castings output this year will reach 18 million tons (p. 27) . . . Westinghouse has developed a plating method that promises to conserve critical nickel (p. 30).

AS THE EDITOR VIEWS THE NEWS **STEEL**

April 30, 1951

Is It Workable?

While Gen. Douglas MacArthur was being accorded more national attention than has been bestowed upon any other individual in our country, two events occurred in Washington which should concern executives of all metalworking companies. One was re-establishment of the Wage Stabilization Board over protests of industry representatives of the National Advisory Board on Mobilization Policy. The other was Eric Johnston's announcement that profits will be a controlling factor in determining industry price ceilings.

To understand how these seemingly independent actions may affect industrial companies, consider first the fundamentals of Mr. Johnston's new policy. It provides that a company in an industry whose current profits equal or exceed 85 per cent of the average of the best three years from 1946 to 1949 cannot increase prices unless it can show hardship or inequities resulting from unusual circumstances. "Profits should be figured before federal income and excess profits taxes and after normal depreciation only, with adjustments for any changes in net worth."

The avowed intent of this admittedly "tough" policy is to force manufacturers to absorb more of the higher costs in wages, freight rates, materials and supplies and to pass on to buyers a smaller portion of these increases. Mr. Johnston also makes the point that the policy provides an incentive for efficiency.

However, in specifying that profits be figured before taxes, the new policy forces manufacturers to absorb increases in taxes. Also, the reconstitution of WSB under peculiar circumstances probably means that there will be no effective check against wage increases. With little visible evidence that Washington is interested in curbing either non-essential government expenditures or unwarranted wage increases, it looks as if industry is being asked to absorb an undue amount of increased costs, a considerable portion of which would be unnecessary if Washington would abandon its "politics as usual" attitude.

Furthermore, the detail involved in operating the prices-tied-to-profits plan will be tremendous. In fact, even a cursory analysis of some of the moot points in Mr. Johnston's letter to Mr. DiSalle will cause many observers to doubt whether the complicated program is workable.

E. L. Shaner

EDITOR-IN-CHIEF

TAX EXCEEDS PROFITS: This publication's 26th annual financial analysis of the steel producing industry, covering operations for 1950, reflects many factors that are associated with inflation and emergency conditions. Reports from 30 producing companies, representing 95 per cent of the nation's steel ingot capacity, show total sales in 1950 of more than $9 billion, an increase of 26 per cent over sales in 1949. The gain is due to increased volume and higher prices.

Employees and the federal government enjoyed liberal shares of this larger revenue. The number of employees was larger in 1950 than in 1949 and they worked more hours, and at higher unit wages. As a result, total payrolls were much higher in 1950 than in the preceding year. Federal taxes for the 30 companies totaled more than $760 million in 1950. This is more than double the federal tax take of 1949. Even more significant is the fact that it exceeds total net profit of the 30 companies in 1950 by almost $20 million. — Insert following p. 32.

* * *

CASTINGS ARE BASIC: Many of the 3000 visitors who attended the 55th annual convention of the American Foundrymen's Society in Buffalo last week thought that the atmosphere of the meeting was reminiscent of that of the period immediately following Pearl Harbor. Many sessions were marked by references to DO ratings, shortages of materials, CMP, personnel problems and Army, Navy and Air Force specifications. Sessions which attracted major attention were two in which representatives of the National Production Authority participated in a day-long symposium on "Principles of Gating."

However, the tone of the 1951 convention differed from that of conventions following Pearl Harbor in one noticeable particular. In 1942 foundrymen labored under the handicap that Washington officialdom failed to understand the true importance of the castings industry. Last week in Buffalo, foundrymen were buoyed by the knowledge that today Washington recognizes the foundry industry as basic. This has been due largely to fine industry—government liaison which has been carried on consistently since the end of World War II. —p. 27

* * *

HOW ONE SHOP DID IT: A small screw machine products shop in Cleveland, employing slightly more than 100 persons and normally turning out about 30 civilian products, affords a good case study of a company that has found defense subcontracting to be a partial solution of problems resulting from materials shortages.

Threatened with the possibility of having to curtail peacetime output because of increasing difficulty in procuring steel, copper and aluminum, officers of the company instituted an aggressive drive for defense subcontracts. Today they are producing components for 20 prime defense contractors. Their output is about evenly divided — 50 per cent for defense and 50 per cent for civilian goods. The company is getting sufficient materials to operate at capacity — in fact is expanding capacity.

The defense work is exacting and causes headaches, but it helps the company to continue civilian production sufficiently to protect its competitive position. —p. 34

* * *

PROCESS SAVES NICKEL: Westinghouse Electric Corp. has developed a new technique in metal plating which gives promise of conserving substantial quantities of critical nickel. Where no nickel is permitted, the process provides a chrome-on-copper finish that is bright and has satisfactory corrosion resistance. Where some nickel is permitted, the process makes it possible to substitute copper for a major part of the nickel normally used.

The key feature of the new system — called periodic reverse plating — is an electrical "back-stroke" that alternately deposits metal and then takes some of it away. This reversal is repeated many times until a satisfactory, smooth, bright surface is achieved. The process can be applied easily to auto bumpers, door handles, radiator grills, body trim, toasters, irons and tubular furniture. —p. 30

* * *

TAPS WITH EXPLOSIVE: Open-hearth furnaces are being tapped with small high-explosive charges which employ the principle of the bazooka. The tapper consists of a 2-ounce explosive on one end of which is imbedded a thin copper cone. This unit is in a plastic case surrounded by a hollow shaped insulating body. When the charge is detonated, the tapper directs a high-velocity jet of tiny copper fragments into the taphole, clearing it quickly.

To date 3000 jet tappers have been used on open-hearth furnaces and of these, 82 per cent have produced successful taps. The failures were due to improperly closed holes, inadequate cleaning of holes or "low" tapholes. It is believed that after operators have gained more experience with jet tappers, the percentage of unsuccessful attempts will drop appreciably. —p. 64

How Can You Prepare for CMP?

You can get set by understanding regulations as they appear, gathering company data in advance, setting up tentative bookkeeping systems to cope with the paper work

WHAT can you do now to be ready for the Controlled Materials Plan when it goes into effect July 1?

STEEL posed that question to CMP officials in Washington and to men in industry who had first-hand experience with CMP during World War II. Here is their advice:

Homework Needed—Get CMP regulations and forms from the Commerce Department field office nearest you. Get them, read them and study them. A problem in the old CMP was that an astonishing number of companies didn't really understand the plan. NPA's CMP Reg. 1 will be issued about May 1 and Regs. 2, 3 and 4 will come out about the same time or a few days after. Reg. 1 will cover general rules for operation; Reg. 2, inventories; Reg. 3, preference ratings; Reg. 4, warehouses; Reg. 5, maintenance, repair and operating supplies; Reg. 6, construction; Reg. 7, repair shops. Regs. 5, 6 and 7 will be issued as soon after the first four as possible. STEEL has carried and will carry all pertinent information (see STEEL, Apr. 16, p. 43).

To help you get a quick understanding of CMP, four three-man teams will be sent out to conduct clinics in all the principal cities. See the tentative schedule on this page for the one nearest you. Consult with your Commerce field office as to the exact place of meeting.

WALTER C. SKUCE
. . . in charge of CMP

Get Set—If you are a medium-sized or large company and you expect a lot of bookkeeping in connection with CMP, it would be wise to set up tentative procedures based on World War II experience. If you are a small company or if you had no experience with CMP during World War II, sit tight and await instructions from Washington. From the government end, the accounting system will stem from the Comptroller's Office of Defense Production Administration. Each government agency involved will probably do much of the paperwork for the tonnages with which it is concerned. For you, materials consumption statistics for steel, copper and aluminum will be required. Get them organized so you can submit them quickly. No statistics for non-CMP materials will be needed, but it would be wise to keep consumption records on those materials, just in case. Consumption data may be developed either on your own or in connection with other companies in your trade association.

Regulations will require prime and subcontractors to submit monthly reviews of the CMP materials they receive. No quarterly carry-overs will be permitted. Once CMP is underway, your accounting system will have to be set up just like the claimant U. S. agency that is handling your account. If yours is a company that has no base period for the defense product you are going to manufacture because you're a new company, had a strike in the base period or are converting to some product foreign to your operations you will be granted an adjusted base period.

CMP Clinic Schedule

City	Date
Atlanta	May 17
Boston	May 17
Chicago	May 15
Cleveland	May 21
Dallas	May 21
Denver	May 18
Detroit	May 15
Houston	May 22
Kansas City	May 21
Los Angeles	May 22
Minneapolis	May 16
New Orleans	May 18
New York	May 18
Philadelphia	May 16
Pittsburgh	May 22
Portland	May 18
Richmond	May 16
San Francisco	May 21
Seattle	May 17
St. Louis	May 22

Foresight Pays—In preparing for CMP, remember this: The program is still tentative and will be evolved as time progresses. To cope with the evolutionary changes, gather as much statistical information about your company and industry as possible. If you do that, you'll be better prepared to jump with the wind which is certain to blow CMP in directions that can't be accurately predicted now.

MRO Loses Meaning

Maintenance supply plan is losing its teeth. We'll have to wait for an effective program

NPA'S ORDER permitting almost any type of enterprise to use a DO-97 rating for maintenance, repair and operation supplies is rapidly losing most of its meaning.

When the Controlled Materials Plan is put into effect July 1, it will have an MRO provision, but that means we'll probably have to struggle along with no real MRO in most of May and all of June. That six-to-eight-week void could be dangerous. The two types of organizations that have filled most of the DO-97s, steel warehouses and mill supply firms, agree that an effective MRO order is still needed to keep the economy in balance. As it looks now, NPA will try to doctor the present MRO order along until July 1, but many industrialists who have had experience with it believe the order is beyond the stage where it can be even partly revived.

Weaknesses—The present MRO regulation is failing because it is too broad as to the kinds of enterprises that may use it, too broad as to the types of items classified as MRO supplies and too lax as to how it should be administered. Amendments have tightened up the first two loopholes, but perhaps too late. The third difficulty is not remedied yet and means that irregular use of MRO—

largely through ignorance and carelessness and a little through dishonesty is still going on. An MRO amendment for Apr. 16 which relieves the pressure on jobbers specifies that many consumer durable goods, including automobiles and appliances cannot be obtained via DO-97. The type of enterprises that uses DO-97s is narrowing, but distributors are still getting orders from organizations as far from industry as educational institutions and state and city governments.

Regulation 5 of CMP will deal with MRO. Industrialists think that phase of CMP will be successful only if MRO items are even more severely limited than they now are, only if the kind of enterprise eligible to use the aid is more restricted and only if administration is tighter. A fourth factor that would improve MRO under CMP is a device that would permit the distributor to get stock in advance. At it works now, the jobber has to wait to get ratings and then can get inventory. A technique to get advance stocks was worked out in World War II and functioned successfully.

Big Bite—Today jobbers' inventories are as badly out of balance as at any time since the end of World War II, largely because of the inroads into stocks made by DO-97s. The proportion of total jobbing volume that goes out under DO-97 ratings varies widely from distributor to distributor. The average for mill suppliers is about 30 per cent. Steel warehouses—their inventories are in worse shape than mill people's—do much less MRO business. Major items that are sold under DO-97s by mill suppliers are cutting tools, grinding wheels and hand tools such as hammers, pliers and screw drivers. Steel products that get the heaviest MRO play in warehouses are standard carbon items. Warehouses honor MRO orders when they can, but only after DOs for direct military programs are taken care of.

Although there are many exceptions to this, small companies generally make greater use of the MRO regulation than do large firms. The latter can use their size to get material with no priorities.

SKF Plans $10 Million Expansion

SKF Industries Inc. will spend $10 million on expansion of buildings and equipment.

The program will include an extension of plants at Philadelphia and Shippensburg, Pa. Construction has already been started which provides facilities for more ball and roller bearings to meet defense requirements.

BOOM TOWN: A $27,250,000 defense expansion program is centered at the Midland, Pa., works of Crucible Steel Co. of America. A new blast furnace will be built, and the plant's capacity to produce open-hearth and electric furnace steels will be increased. Enlarged finishing facilities for special purpose steels are included in the program. Work is scheduled for completion in 1952

Price Regulations Aim at General Rollbacks

GET SET for a great deal more paperwork, new inequities and probably lower profits to follow the new price control measures being established by the Economic Stabilization Agency.

Control authorities are moving away from the General Ceiling Price Regulation toward more specific limitations on prices. On many manufactured articles, rollbacks will be ordered.

On some others, upward price adjustments will be allowed. The rollbacks are expected to exceed the increases.

Moves already made or about to be made include:

1. Basic price-control policy provides no industry will be permitted to increase prices if the industry's dollar profits amount to 85 per cent of the average of its three best years during the 1946-49 period.
2. Ceiling Price Regulation 22 sets prices for a vast number of manufactured articles at pre-Korean levels plus increases in factory labor and materials costs.
3. Several supplementary orders are being prepared. Three of these will control manufacturers prices for machinery and related equipment, for cotton textiles, and for apparel and shoes.

Another will provide an alternative pricing method to CPR 22, designed for multi-product companies which may find CPR 22 unworkable.

Rollbacks—Price Stabilizer Michael DiSalle says the general manufacturers ceiling price regulation will require some rollbacks in prices. Briefly, the regulation permits manufacturers to add increases in factory payroll and materials costs to pre-Korean prices in optional base period of Apr. 1 to June 24, 1950, or in any one of the three previous calendar quarters. The regulation does not allow addition of increased overhead and administrative expenses, sales promotion, advertising or overtime pay.

Manufacturers with last fiscal year gross sales under $250,000 have the option of using CPR 22 or remaining under the General Ceiling Price Regulation.

The regulation becomes effective May 28.

While the regulation covers most manufactured goods, it exempt metals and minerals, including ores, alloys, scrap, nonmetallic minerals and fabricated structural steel; fuels, including coal, coke, gas and electricity; passenger automobiles; chemicals and raw agricultural and forest products.

Olds Hits Price Rule

U.S. Steel chairman charges the new government price-profit rule is unfair, unsound

ARBITRARY, unfair and something that may have a detrimental effect on production at a time when it is sorely needed is the way Irving S. Olds, chairman, U. S. Steel Corp., sizes up Economic Stabilization Director Eric Johnston's recently announced policy tying in industry price increases to profits.

Under this policy Mr. Johnston proclaims that industries seeking higher prices to compensate for higher costs must prove they are earning less than 85 per cent of their average earnings in the best three out of four years, 1946 through 1949. The policy applies to appeals for price increases on an industry-wide rather than individual company basis, except in certain circumstances.

Unnecessary, Unsound—"Provisions under the existing laws for renegotiation of government contracts, excess profit taxes and corporate taxes make such arbitrary limitation on industrial profits unnecessary as well as unsound," Mr. Olds believes. The apparent ruling out of accelerated depreciation in computing profit for the base period would hamstring many companies, he says.

Operating costs of the corporation since the first of the year have increased. Factors included the increase to coal miners Feb. 1, higher scrap and other raw materials costs and higher steel labor costs. Overtime expenses in the first quarter were double those of the corresponding period of last year.

High Plateau—Commenting on the outlook at a press conference in New York last week, Mr. Olds saw little let-up over the rest of the year in steel production. So far, steel orders have been increasing, and indications point to defense requirements as more than offsetting any lull in civilian needs.

As for defense, he estimates that directives will take about 50 per cent of the corporation's production in June—20 per cent for direct defense and 30 per cent for defense-support programs.

Orders Rise — New orders in the first quarter amounted to 7 million tons of finished steel, up about 10 or 12 per cent over the same period a year ago. Backlogs are up a bit, amounting to between four and five months' production. There is little change in product-mix, except for the greater substitution of plates for sheets. Exports are light, running currently at slightly more than 3 per cent of total. Reason: Very little steel to spare.

A new all-time ingot production record of 106.2 per cent was set for the corporation in the week beginning Apr. 16. This was on the basis of rated capacity at the beginning of the year. The following week it was 105 per cent.

Manganese—The corporation is developing a new large manganese ore property in Brazil, with the possibility that shipments may be moving in volume within a year and a half or two years. Transportation from mines to seaboard is one of the complicating problems. The corporation has another property in Brazil from which it has been receiving about 30 per cent of its manganese ore requirements, but this property is being pretty well worked out.

Foundry Output To Reach 18 Million Tons

Casting shops get early start in defense work as result of postwar industry-government liaison. Pig iron, scrap, coke and other shortages to place ceiling on production

CASTINGS production this year will approximate 18 million tons, or 1.5 million tons above the previous record. That prediction departing President Walton L. Woody made to the American Foundrymen's Society at its 55th annual meeting in Buffalo Apr. 23-26.

Many foundries already are producing more than they did in World War II. The ceiling on castings production likely will be materials shortages. Foundries are feeling acutely the scarcities in pig iron, scrap coke, nonferrous metals and alloys.

It's Basic—Under impact of the defense program, the castings industry currently finds itself in a situation similar to that which existed following Pearl Harbor. There is one notable difference, however: This time it has recognition as a basic industry. Last time, the foundry industry lacked classification as essential and lost much valuable time while gaining recognition.

With this roadblock removed, due chiefly to an industry-government liaison developed and maintained since World War II, foundries are already deeply involved in the rearmament program.

Accent on Defense—Injected constantly in the more than 90 technical papers, discussions, luncheon and dinner addresses, were references to increasing volume of DO orders, CMP, growing shortages of raw materials, Army, Navy and Air Force specifications, and future manpower difficulties. But despite the handicaps which these influences threaten, foundries are technologically and physically prepared to meet the demands for castings.

WALTER L. SEELBACH
. . . American Foundrymen president

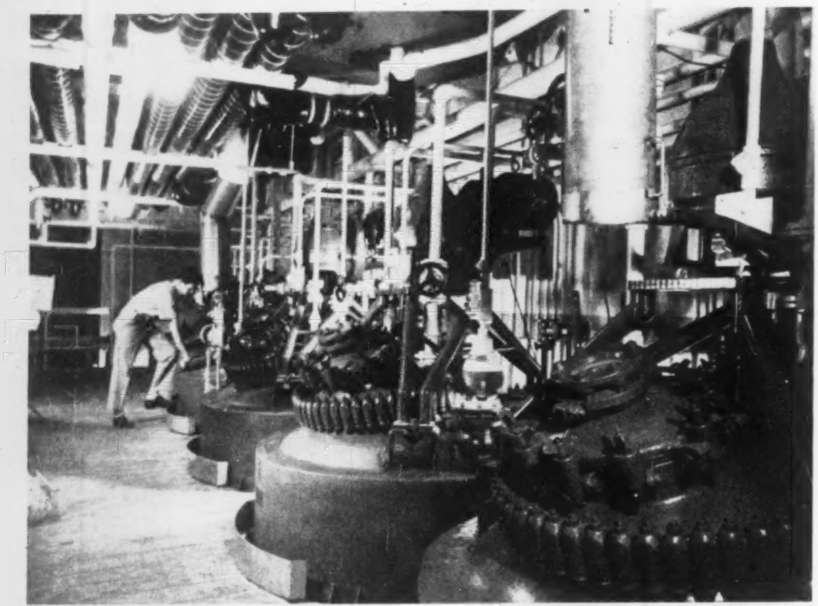
The defense atmosphere of the convention, attended by some 3500 foundrymen from all parts of the United States and Canada, was pointed up in two exceedingly well-attended luncheon meetings. The first, sponsored by the Foundry Equipment Manufacturers Association and the Foundry Facings Manufacturers Association, featured two representatives of the Foundry Equipment and Supplies Section, Metalworking Machinery Branch, NPA, Washington. They were Aubrey J. Grindle, director, and Thomas Kaveny Jr., of Herman Pneumatic Machine Co., Pittsburgh, who is serving as industry consultant.

"Defense Production" was the keynote of the second luncheon meeting which was of interest to all foundries. Speakers, all from Washington, included A. J. McDonald, chief, Castings Section, Iron & Steel Division, NPA; John A. Claussen, chief, Pig Iron Section, Iron & Steel Division, NPA; Lieut. Comdr. William A. Meissner, Bureau of Ships, and liaison officer to NPA; and Nigel Bell, director, Light Metals Division, NPA.

Seelbach Elected—Walter L. Seelbach, president and general manager, Superior Foundry Inc., Cleveland, was elected president of the society. He succeeds Walton L. Woody, National Malleable & Steel Castings Co., Cleveland. New vice president is I. R. Wagner, director and former president, Electric Steel Castings Co., Indianapolis.

Directors elected for three-year terms include: Martin J. O'Brien Jr., works manager, Symington-Gould Corp., Depew, N. Y.; Harry W. Dietert, president, Harry W. Dietert Co., Detroit; Albert L. Hunt, works manager, National Bearing Division of American Brake Shoe Co., St. Louis; Dr. James T. MacKenzie, technical director, American Cast Iron Pipe Co., Birmingham; and A. M. Ondreyco, plant manager, Vulcan Foundry Co., Oakland, Calif.

The 65th annual meeting and show will be held in Atlantic City, N. J., May 1-7, 1952.



Authenticated

NO METALWORKING SCENE: But a lot of steel and many products of the metalworking industry go into the making of pharmaceuticals to maintain the nation's health—as attested by this activity at the plant of Charles Pfizer & Co. in Groton, Conn. These batteries of glass-lined tanks are used to make crystalline vitamin A on a large commercial scale

Tool Distributors Meet

AMTDA hears condemnation of Washington's attitude toward machine tool industry

CONFUSION prevailing throughout the machine tool industry due to lack of understanding in Washington as to financial and production problems facing this industry came in for heavy condemnation by speakers at the 27th spring meeting of the American Machine Tool Distributors' Association at Edgewater Beach Hotel, Chicago.

Lloyd McDonald, executive vice president, Warner & Swasey Co., Cleveland, a guest of the association, stated that on recent visits to Washington as a member of the Government Relations Committee, National Machine Tool Builders' Association, he and fellow committeemen have been treated as though they had "the thing" with them when they attempted to get sympathetic hearings on machine tool problems in connection with national defense.

Disappointed—There seems to be an idea in Washington, Mr. McDonald reported, that machine tool manufacturers now rate no more consideration than manufacturers of pots and pans. He quoted a man high in National Production Authority as saying: "We have more machines to cut metal than we have metal to cut up." Another, who is a member of the Munitions Board, remarked that since the nation now has so many more machine tools than it had in 1940, there should be no machine tool problem at this time.

Even though the industry's backlog now stands at 22 months (never during World War II did it exceed seven months), machine tool builders today actually are short of money. After spending large sums on new equipment and inventories, they now face the fact that they cannot borrow against government "pool" contracts because a recent ruling by the Comptroller General of the United States makes such loans impossible from banks. A tool builder can't borrow on a government-secured loan if he already has borrowed from his bank. A government-secured loan automatically puts his earlier bank loan into a junior position. No bank would agree to that situation. Hence the industry is cramped financially at a time when expansion is necessary, Mr. McDonald pointed out.

Greater Threat—Price control, said Mr. McDonald, presents an even greater threat. The General Ceiling Price Regulation established Jan. 26, 1951, sets the maximum price for any machine tool as that at which such a machine was "delivered" in the base period ending Jan. 19, 1951. Machine tool prices are quoted months before shipment. On many which were shipped in January, quotations were made late in 1949, or early in 1950 on the basis of price lists printed in 1947 or 1948. What the ruling amounts to under existing conditions, is a "rollback" in machine tool prices of two or four years. Unless corrected, this ruling will plunge the industry into a bath of red ink.

"Three-way" Session—Demonstration that the machine tool builder, the machine tool distributor and the machine tool user together constitute an economic structure which can be likened to a three-legged stool was given by a "three-way" session. Participating in this were M. A. Hollengreen, president, Landis Tool Co., Waynesboro, Pa., on "What the Builder Expects from the Distributor;" George Habicht, Jr., chairman of the board, Marshall & Huschart Machinery Co., Chicago, on "What the Distributor Expects from the Builder;" and G. P. Longabauch, director of equipment, Westinghouse Electric Corp., Pittsburgh.

Annual meeting of AMTDA, at which new officers will be elected, will be held at Westchester-Biltmore Country Club, Rye, N. Y., Oct. 7-9.

Tool Pool Orders Awarded

Six additional "pool" orders for machine tools to aid industry speed production for national defense were made by the General Services Administration.

Companies receiving them and the order values are: Hydraulic Press Mfg. Co., Mt. Gilead, O., $689,340; Denison Engineering Co., Columbus, O., $879,599; E. W. Bliss Co., Canton, O., $3,115,420; Clearing Machine Corp., Chicago, $1,539,493; American Steel Foundries, Elmes Engineering Division, Cincinnati, $865,680; and Bardons & Oliver Inc., Cleveland, $1,525,017.

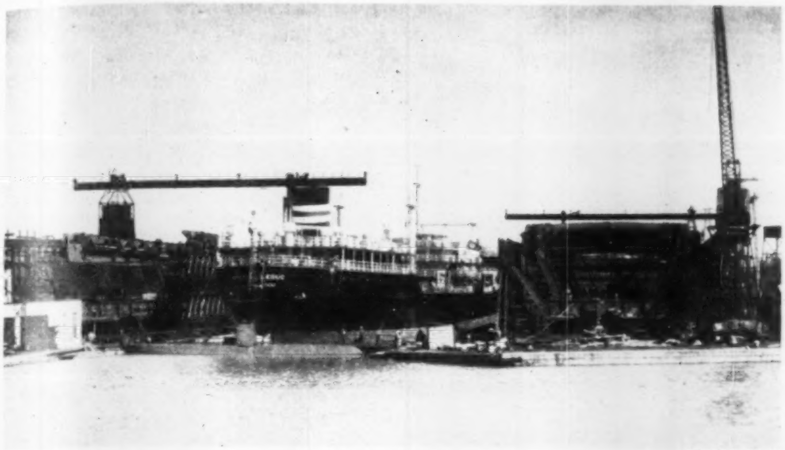
With these orders, totaling $8,614,549, the total amount of "pool" orders placed by GSA with 22 manufacturers stands at $87,057,820.

Under the system, GSA, upon recommendations of the National Production Authority, places orders with machine tool manufacturers to enable them to fit the machines into production schedules without delay.

Tools not disposed of at the time of completion will be bought by GSA at 17½ per cent less than the sales price— the estimated profit and selling expense—and stored where they will continue to be available for sale or use in government plants.

Use of Pool Orders Widened

To the machine tools in the government's pool order system have been added about $100 million of cutting tools and gages, swelling the planned outlay for the entire pool to about $450 million.



Carl McDow

SHIP-SHAPE: Undergoing repairs at Lorain, O., yards of American Shipbuilding Co. is Imperial Oil's new super tanker, S. S. Imperial Leduc, flanked by 20,000-ton ore carriers in process of construction. The ore boats will be 647 feet long and 70 feet wide when finished. The first one is due to be launched some time in August. Several other ore carriers are in yards for repairs

More Depreciation

DPA approves 915 certificates of necessity permitting five-year writeoffs

FROM Oct. 30, 1950, to Apr. 6, 1951, the Defense Production Administration approved 915 certificates of necessity that will permit five-year amortization of the cost of new defense facilities.

Total cost of new facilities proposed for construction exceeds $4.1 billion. The greatest concentration of new industrial expansion authorized will be in New York, New Jersey and Pennsylvania. About two-thirds of the dollar amount of that area's expansion, $756,460,000, will be in Pennsylvania. New York's portion is $270,487,000; New Jersey's $117,310,000.

Rich States—Pennsylvania will get the most defense expansion. Texas will get the second largest—$569,873,000; Ohio the third largest—$376,336,000; Connecticut the fourth largest—$324,233,000. Connecticut's share will drop, though, if the New England steel mill proposal falls through.

The only states for which no facilities expansion has been approved are North and South Dakota. Vermont has approval for a $38,000 project.

More Coming — Ninety-four more certificates of necessity were granted by DPA between Apr. 9 and 13. Total cost represented by that part of the facilities certified for rapid write-off is $218,523,000. Transportation and scrap iron facility expansions highlighted this latest group of approvals. Largest program of the lot was a $33.1 million approval for a General Motors Corp. jet engine plant at Flint, Mich. Of the 94 programs, seven were for scrap iron facilities, 13 for transportation.

Merger Negotiations Off

Merger negotiations between Pittsburgh Steel Co. and Allegheny Ludlum Steel Corp. are off.

In a joint statement they say that "pursuant to a study by the respective managements of each company's business and facilities, supplemented by independent engineering reports, it has been decided that each company will continue with its separate expansion program and merger negotiations have been terminated."

To Enter Flat-Rolled Market

To enter the flat-rolled steel market, Pittsburgh Steel Co. awarded United Engineering & Foundry Co. a contract for a 66-inch continuous hot strip-sheet mill for its Allenport, Pa., works. Pittsburgh Steel now specializes in wire and tubular goods. Capacity of the new mill will be 900,000 tons a year. Installation is to be completed in July, 1952.

Sheet & Tube Shifting Capacity

Expansion and revamping of facilities of Youngstown Sheet & Tube Co. will, when completed, give the company as much ingot producing capacity in its Chicago district as in its Youngstown district.

Heretofore about 66 per cent of the company's ingot capacity has been in the Youngstown district and approximately 34 per cent in its Chicago district plants.

The program will provide facilities for about 1 million additional tons of ingots.

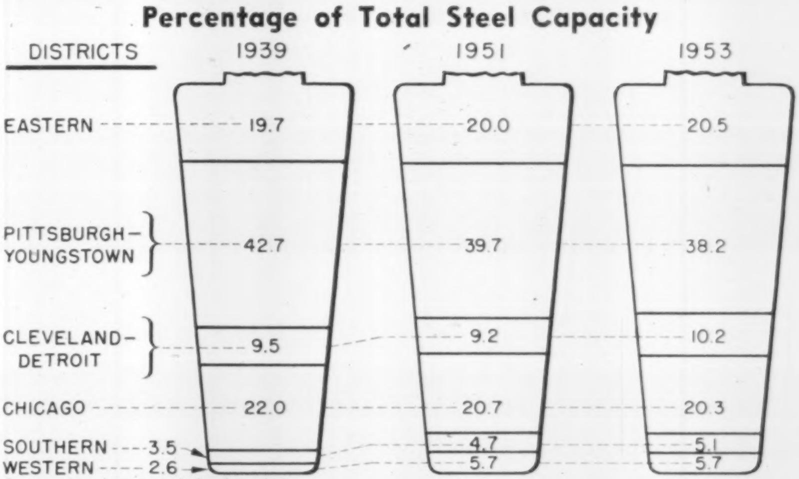
How Does Our Steel Capacity Stack Up by Districts?

WHAT DISTRICTS are growing as steel producing areas? Which ones are losing?

Answers to those frequent questions are graphically presented in the accompanying chart prepared by STEEL on the basis of figures issued by the American Iron & Steel Institute. They show the percentage of the country's capacity each of six districts had in 1939, what they have in 1951, and what they will have in 1953.

The Cleveland-Detroit district, which lost a little percentagewise from 1939 to 1951, will have gained by 1953. Other districts making gains are the eastern, southern and western, although the western district will have leveled off after 1951.

Districts losing are Pittsburgh-Youngstown and Chicago.



Source: American Iron & Steel Institute

New England Mill Hangs Fire

New England's hopes for obtaining a new integrated steel mill in the near future are hanging fire.

The Connecticut Steel Advisory Committee completed a study of the economic feasibility of the project and reported:

1. That a steel mill independently operated would be unjustified economically and should not be encouraged.

2. That if an existing steel company should express an interest in building and operating a steel mill in the New London, Conn., area, the state should aid and encourage such a venture.

Attempts to interest established steel mills in the New England project are continuing with results of the committee's study in mind.

Metal Powder Uses Studied

Ordnance applications for metal powders was the principal subject magnet attracting 600 to the seventh annual meeting of the Metal Powder Association in Cleveland last week which featured coincidentally an exhibit of powders, equipment and products offered by 18 manufacturers in the field.

Since last August, Army Ordnance has been accelerating its program for the use of sintered powdered iron rotating bands for large-caliber shells and a committee of representatives from a number of interested companies has been developing tentative specifications and surveying sources for powdered iron (see p. 53). Their work has moved fast and semiproduction orders for 2000 bands have been placed with key suppliers. Watertown Arsenal has been closely connected with the program since 1945 when it was learned that the Germans had switched from nonferrous to sintered iron rotating bands for practically all their shells, from 20-mm on up. At the close of the war consumption of iron powder in Germany for this purpose was close to 6 million pounds a month and plans had been developed to double that quantity.

Reports are heard that Ordnance has tentatively standardized on sintered iron bands for two rounds of high-velocity armor-piercing shot and is conducting firing tests on 90-mm and 105-mm sizes so equipped. Iron powder used is a hydrogen-reduced material, with density ranging from 5.5 to 5.8 grams per cubic centimeter. This is a relatively low density for iron compacts, and the bands are impregnated with hot paraffin before being seated in the shells.

Flash of Brilliance

Westinghouse comes up with an answer to bright finishes without nickel

THAT BRIGHT trim on automobiles and appliances won't have to be a thing of the past, say Westinghouse Electric Corp. engineers. A method they've developed may hold the answer to the problem of conserving huge quantities of critical nickel without sacrificing the bright corrosion-resistant finish.

The technique—called periodic reverse plating—calls for a layer of copper about one-thousandth of an inch thick to be plated onto the steel base. Key feature of the system, says George W. Jernstedt, manager of electroplating projects for Westinghouse, is an electrical "back-stroke" by which metal is alternately deposited and taken away until a smooth layer of the required thickness is built up.

Although not as scarce as nickel, copper is also a critical material. But the new system requires only small quantities—much less than for other metal substitutes proposed. In addition, plenty of copper-plating solution is already available for use.

Mr. Jernstedt said that Westinghouse has been using the process for more than a year in electroplating its appliances. Now several automobile manufacturers and suppliers are adopting it for use on many types of auto parts and accessories. In cases such as auto bumpers where nickel is permitted, PR plating makes it possible to substitute copper for a major part of the nickel normally used.

NO-NICKEL PLATING
. . . lifesaver for bright finishes?

Canada Becomes Nickel Nurser

Canada, producer of about 90 per cent of the world's nickel, will institute compulsory government rationing of this essential metal on May 1. No drastic curtailment of nickel to civilian industry is expected, say Defence Production officials.

Top priority will be given to rearmament projects in Canada, the United States and Great Britain. Most civilian manufacturers of consumer goods now get about 65 per cent of their 1950 purchases through a voluntary rationing system introduced late last year. "One aim of government control is more equitable distribution," said a Defence Department official. By placing nickel under government control, official scrutiny can be made of manufacturers' stockpiles.

Strong Aircraft Alloy Evolved

A rugged new alloy, 10 per cent stronger than the highest strength aluminum alloy now in use, has been developed by Aluminum Co. of America. It is presently being made available to plane builders for experimental and controlled production use only. Temporary designation is XA78S.

The development was accomplished by modifying the same alloy constituents that were combined to produce Alcoa Alloy 75S, designed expressly to meet the needs of the aircraft industry in 1944. They are both of the aluminum-zinc-copper-magnesium family.

Higher in tensile and yield strengths than 75S, the new alloy has about the same elongation and fatigue properties. Limited tests indicate that the increase in mechanical properties will involve some sacrifice in workability. For the present, the new alloy will be produced in sheet and plate—in both bare and alclad forms—and extrusions.

Ekco Enlarges Geneva Plant

Ekco Products Co. will build a 60,000-square-foot addition to its Geneva Forge Cutlery Plant at Geneva, N. Y. The program will supplement plant capacity as well as provide for defense needs. Expansion will include an 8000-square-foot office building with latest conveniences for employees.

Authenticated

BIRTHDAY IN BRUSSELS: Celebrating its 25 years of existence this year is the Brussels International Trade Fair which includes this machinery exhibit. The fair's growing importance in the field of international trade has been attracting increasing numbers of manufacturers and buyers from all parts of the world

A Century of European Trade Shows

The current British Industries Fair in London and Birmingham comes 100 years after the first of all international industrial shows, the Great Exhibition of 1851

SIX major trade fairs are now in progress in Western Europe—just a century after the great-grandfather of all international industrial fairs was held at London's Crystal Palace.

At Brussels, Belgium, an international industries fair emphasizing consumer goods will be in progress until May 6. Liege, Belgium, will be host until May 6 to an exhibition of heavy machinery and equipment. General trade fairs will be held at Graz, Austria, until May 6 and at Paris until May 14. Hanover, Germany, is the scene of a heavy industries fair until May 8. The British Industries Fair opens today and closes May 11 at London.

100 Years Old—The London-Birmingham event will celebrate a century of British industry and the centenary of the Great Exhibition of 1851 held in the Crystal Palace. Then, the world was amazed at international industrial progress as evidenced by the exhibits from all over the world in the London arena. Today, a fair using three large halls in two cities can't even show the range of British industry alone. Auto, machine tool and shipbuilding industries are not represented at the 1951 fair. Separate exhibitions are needed.

The industry accounting for most of the attention in 1851 was textiles, which employed one out of every 19 people in the British Isles—over 1 million workers. Textiles are still among the great British industries, and they will display at this BIF. But although their range has been extended they employ fewer workers now and a much smaller part of the population than they did in 1851.

Scorned—Exhibits generally ridiculed at the 1851 show were those from the U. S., particularly the domestic sewing machine and the reaping machine. Few British or Americans, for that matter, realized a century ago that the metalworking industry with such forerunners as sewing and farming devices would become the giant of all industries.

Today at BIF metalworking products ranging from pots and pans to mobile cranes will be on display in nearly all of the hall in Birmingham and in part of Olympia in London. Textile products will be shown only in part of Earls Court in London.

Buying, Not Selling, Is Problem

Ironic today is the fact that six major trade fairs are now in progress in Western Europe at a time when producers can easily sell everything they make. Of more immediate aid to European metalworking men now would be help in getting raw materials.

Britain—British industry is hardest pressed for steel and steel scrap. In 1950, steelmakers obtained 4,715,200 net tons of scrap that they themselves generated, 4,424,000 tons purchased from domestic sources and 2,139,200 tons purchased from abroad. Before the war, the U. S. was the chief supplier of foreign steel scrap to Britain and Western Europe. But that's a thing of the past now, and the major supplier is West Germany. Germany will not be an exporter long, for before World War II she imported much of her ferrous scrap. In 1937, the Reich imported 600,000 tons. By the end of 1950, West Germany's scrap exports dropped to a dribble, and this year she, too, may have to import. The only answer to Britain's scrap shortage is increased generation of home supplies. Scrap drives reminiscent of World War II days have already been started to reach this source.

Steel production is slipping a little, partly because of the scrap shortage. Output in the first quarter was an annual rate of 18,396,000 net tons, slightly below the 1950 level. April figures will decline even more.

West Germany—Ruhr industrialists are alarmed about shortages of coal and pig iron which are affecting steel production. Germany is importing U. S. coal, but 80 per cent of the steel made as a result of that coal must be exported. In March 1,096,700 net tons of ingots were produced, compared with 1,036,200 tons in the short month of February, but 77,000 tons of the March output had to be exported on the coal account.

Not of immediate concern in Germany is iron ore, because 13.2 million tons of ore will be mined domestically in 1951, a new record and 50 per cent more than in 1936.

France—French strikes have made materials shortages even worse than they normally would have been. France is now producing rolled steel at the rate of about 25,000 tons a day, fairly good, but a shade below February and January averages. Metallurgical coke and scrap are particularly tight.

Coal prices have gone up about 8 per cent, and finished steel quotations will also rise, perhaps as much as 30 per cent on some products.

Belux—If Belux can keep producing at her first quarter rate, her 1951 steel production will reach about 8.3 million net tons, a new peak above the previous record of 7.4 million tons turned out in 1929.

Despite the production, deliveries are extended and prices rising. Belgian export quotations are $135-$140 per metric ton on merchant bars, $155-$170 per metric ton on wire rods, $180-$190 per metric ton on plates.

Small Business 'Break'

That's what DPA is aiming for in its four-point procurement policy

A BETTER "BREAK" for small business in defense production is the aim of a new four-point procurement policy of the Defense Production Administration.

The Four Ways—The policy's four points are: 1. To bring into the defense effort on a prime contract, subcontract or purchase part basis every qualified producer who can be used.

2. To find and put to use the productive facilities of small firms.

3. To give small manufacturers all necessary information concerning government needs and the steps they should follow in obtaining subcontracts as well as prime contracts.

4. To develop and install procurement procedures which will encourage prime contractors to subcontract to small firms the maximum amount of business possible.

How To Do It—To carry out the procurement policy, these eight steps were recommended by two DPA committees which developed it:

1. Contracting officers should require contractors to state in bid or negotiation whether or not additional facilities, either buildings or equipment, will be necessary to accomplish the work.

2. Each service should review its requirements and designate specific items suited for distribution among a number of contractors.

3. Contracting officers should obtain agreement with suppliers that subcontracting will be used wherever possible.

4. Prime contractors should be provided with incentives to subcontract to the maximum degree possible.

5. The Department of Defense should authorize payment of justifiable price differentials to accomplish the objective of keeping the facilities of small business.

6. The Department of Defense should review its "M-Day Production Allocation Program" with a view to broadening, wherever possible, the number of eligible contractors.

7. All production and procurement agencies of the government should continue existing programs of technical aids, production services and contracting and subcontracting assistance to small business.

8. These agencies should undertake a co-ordinated program of information concerning the basic objectives of small business participation in defense production and the means by which this can be accomplished.

NEA

FLAT-TOP WARRIOR: The heaviest of carrier-based planes is this North American AJ-1 attack bomber, in production at Downey, Calif. Folded wing and tail sections permit easy storage and deck handling aboard ship. The bomber is powered by one jet and two piston engines. It carries a crew of three

STEEL's Weekly Summary of Subcontract Opportunities

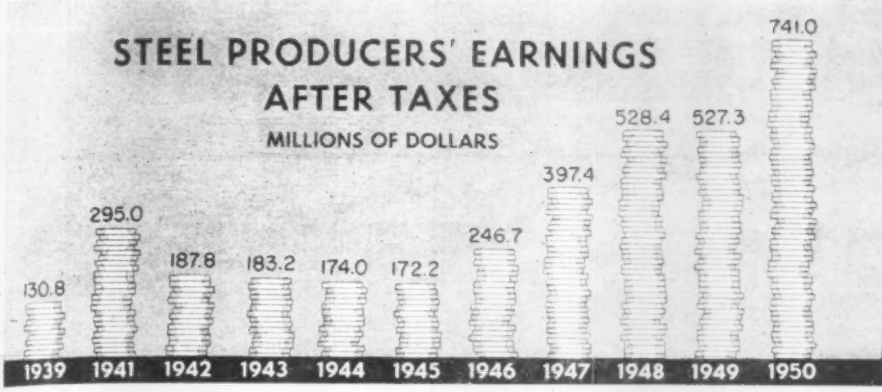
DETAILS of the $57 million contract for medium caliber gun production received by Pontiac Division of General Motors Corp. show it has supplier opportunities sought by many smaller companies.

Most interesting feature for subcontractors is the report by General Manager Arnold Lenz that 1190 of the parts and assemblies will be turned over to approximately 500 outside suppliers. The award just about doubles Pontiac's defense load.

Companies equipped to supply parts for artillery propellant charges may get into defense work when Goodyear Tire & Rubber Co. resumes operation of the Hoosier Unit of the Indiana Arsenal at Charlestown, Ind., to turn out the charges under an ordnance contract. The company employed 10,000 in doing the same job from 1940 to 1945.

Other government awards, of interest to metalworking companies are:

PRODUCT	CONTRACTOR
Trucks	American LaFrance Foamite Corp., Elmira, N. Y.
Truck Chassis	Autocar Sales & Service Co., Ardmore, Pa.
Transmission Assemblies	Cadillac Motor Car Div., General Motors Corp., Detroit Allis-Chalmers Mfg. Co., Milwaukee
Tractors	R. G. LeTourneau Inc., Peoria, Ill.
Semi-Trailers (7½-ton)	Steel Products Co. Inc., Savannah, Ga.
Heater Assemblies (aircraft)	Surface Combustion Corp., Toledo, O.
Warehouse Trailers	Ohio Galvanizing & Mfg. Co., Niles, O.
Milling Machines	Brown & Sharpe Mfg. Co., Providence, R. I.
Universal Turret Lathes	Warner & Swasey Co., Cleveland
Machines (for tap-spacer assemblies)	Pollack Engineering & Mfg. Corp., Newark, N. J.
Lathes (cone head)	W. B. Rapp Machinery Co., Philadelphia
Revolving Ovens (6-tray—oil-fired)	Rainier Electric Oven & Engineering Corp., Seattle
Transmitters	Teletype Corp., Chicago
Power Units	United States Motors Corp., Oshkosh, Wis. D. W. Onan & Sons, Minneapolis Penn Boiler & Burner Mfg., Lancaster, Pa. O'Keefe & Merrit Co., Los Angeles Cyclohm Motor Div., Howard Industries Inc., Racine, Wis. Universal Motor Co., Oshkosh, Wis.
Telephone Central Office Sets	Connecticut Telephone & Electric Corp., Meriden, Conn.
Radio Sets	Hallicrafters Co., Chicago
Motors (26V-DC—17,000 rpm)	Electrical Engineering & Mfg. Corp., Los Angeles
Generators (aircraft)	Westinghouse Electric Corp., Pittsburgh
Tachometer, Generator	General Electric Co., Schenectady, N. Y.
Inverters	Eclipse-Pioneer Div., Bendix Aviation Corp., Teterboro, N. J. Jack & Heintz Precision Industries Inc., Cleveland
Indicators	U. S. Gauge Div., American Machine & Metals Inc., Teterboro, N. J.
Range Finders (T41)	Mergenthaler Linotype Co., Brooklyn, N. Y.
Multimeters	Lanagan & Hoke Inc., Philadelphia
Electric Calculating Machines	Friden Calculating Machine Co. Inc., San Leandro, Calif. Felt & Tarrant Mfg. Co., Chicago. Monroe Calculating Machine Co., Orange, N. J. Marchant Calculating Co., Emeryville, Calif.
Duplicating Machines	Ditto Inc., Chicago. Standard Duplicating Machine Corp., Washington
Periscope Mounts	Gilbert & Barker Mfg. Co., W. Springfield, Mass.



26th ANNUAL
FINANCIAL ANALYSIS
OF THE
STEEL INDUSTRY

Supplement to

STEEL
A PENTON PUBLICATION

April 30, 1951

Operations Reflect Return of Crisis Economy

RETURN of a crisis economy in 1950 is reflected in STEEL's financial analysis for that year's operations of the steel industry.

Demand for steel to strengthen the country's defense boosted sales, production and earnings, and the increased business and war-inspired tax law changes more than doubled the government's tax take.

This financial analysis, the 26th annual one compiled by STEEL, shows that for their efforts and operations last year 30 companies representing 95 per cent of the steelmaking capacity in the United States had a total net profit of $741,009,803, a 40 per cent increase over their $527,284,847 net profit in 1949. Rise in net earnings in 1950 is a return to the uptrend that began after 1945 and continued without break, except for 1949 when earnings declined moderately as a result of the mild recession in business.

For many steel producers, 1950 was a record-breaker for net earnings, as well as for various other facets of their operations.

Record-Breaking Year

In 1950, all 30 of the steel producers listed in the analysis had net profits. In 1949, one of them had a net loss. Only three of the companies reported net profits lower in 1950 than in 1949.

Contributing heavily to the improvement in earnings was a jump in the 30 companies' sales total from $7,246,068,820 in 1949 to $9,184,129,205 in 1950, a 26 per cent increase. For many of the producers, 1950 was a record-breaking one for sales. The high dollar volume of sales in 1950 was the result principally of: 1. Increased demand stemming from the Korean war; and 2. increases in steel prices in December, 1949, and December, 1950.

As demand and sales swelled from the Korean war influence, the volume of dollars that had to be directed into the federal government's tax coffers snowballed. Increase in earnings automatically meant more tax money for Uncle Sam. In addition, the Korean war prompted Congress to boost normal and surtax rates on corporate taxable 1950 income and to levy an excess profits tax for the last half of 1950. A result of all of this was that for every dollar of net earnings of the 30 companies the federal government took an equivalent amount in taxes. The 30 companies had total net earnings of $741,009,803 in 1950; from those companies the federal government in 1950 took $659,276,083 in normal taxes and surtaxes and $101,450,600 in excess profits taxes, making a total tax take of $760,726,683. In 1949, those steel producers paid $375,615,284 in federal taxes.

To show details on the excess profits tax, STEEL added a column to its analysis.

Rate of Earnings Up

Even though the tax bite was deep, the 30 companies' net earnings remaining out of each dollar of sales were a little larger in 1950 than in 1949, the 1950 amount being 8.01 cents, compared with 7.25 cents. The 1950 figure is the largest for any year since STEEL's analysis began recording sales figures 14 years ago.

The increase in net earnings was sufficient to allow a substantial rise in net earnings per share of common stock, after allowance for preferred stock requirements, even though the number of common shares outstanding in 1950 was considerably greater than in 1949. The 1950 net earnings per common share were $8.27, compared with $6.59 in 1949.

As a result largely of the stock splits and stock dividends in 1950, the number of common shares 29 companies had outstanding that year totaled approximately 81 million, compared with 71 million in 1949.

Indicative of the spreading of ownership of the steel industry, 27 of the companies had approximately 494,000 holders of common stock in 1950, compared with 468,000 in 1949.

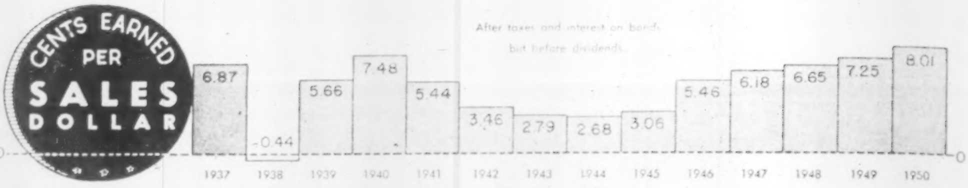
In meeting the country's increased steel needs the companies reporting ingot capacity showed a total capacity increase of 7 per cent in 1950 over 1949. At the same time, ingot production was boosted 23 per cent.

Employment Rises

To turn out this additional steel, 29 companies increased the average number of employees from 745,257 in 1949 to 764,921 in 1950. This is one reason for total payrolls rising from $2,478,119,448 for 27 companies in 1949 to $2,814,490,275 in 1950. Other reasons are longer work-weeks and an increase in steelworkers' wages on Dec. 1, 1950.

Reflecting the increased stature of the steel industry, total capitalization of 29 companies rose from $5,452,326,489 in 1949 to $5,909,181,146 in 1950.

Working capital of the companies rose from $1,925,834,134 in 1949 to $2,064,676,246 in 1950. This increase in working capital meant current assets were slightly more than current liabilities. The rise in current assets was not sufficient, however, to prevent a decline in the ratio of current assets to current liabilities. The ratio in 1950 was 2.26 to 1, compared with 2.75 to 1 in 1949.



	Number of Shares of Common Stock Outstanding 1950	Number of Shares of Common Stock Outstanding 1949	Common Stock Valuation 1950	Common Stock Valuation 1949	Preferred Stock Valuation 1950	Preferred Stock Valuation 1949
United States Steel Corp.	26,109,756	26,109,756[4]	$870,325,200	$870,325,200[4]	$360,281,100	$360,281,100
Bethlehem Steel Corp.	9,582,942	9,582,942	303,459,830	303,459,830	93,388,700	93,388,700
Republic Steel Corp.	5,896,719	5,893,103	135,979,066	135,979,066	28,204,300	28,204,300
Jones & Laughlin Steel Corp.	2,600,327	2,600,327	103,937,000	103,937,000	29,357,000	29,357,000
National Steel Corp.	7,362,045[illegible]	2,453,950	73,620,450	61,348,750	None	None
Armco Steel Corp.	3,954,333	3,909,352	39,543,331	39,093,522	18,234,400	20,000,000
Youngstown Sheet & Tube Co.	3,350,016[8]	1,675,008	105,088,053	105,088,053	None	None
Inland Steel Co.	4,899,315	4,899,315	62,500,000	62,500,000	None	None
Wheeling Steel Corp.	1,423,897[9]	569,559	37,021,322	28,477,950	36,143,600	36,316,600
Colorado Fuel & Iron Corp.[11]	1,191,096	1,145,355	5,955,480	5,726,775	8,587,929	9,554,333
Sharon Steel Corp.	925,863	617,242	9,319,020	6,232,810	None	None
Kaiser Steel Corp.[14]	3,200,000[14]	[14]	3,200,000	[14]	40,000,000[14]	[14]
Crucible Steel Co. of America	488,680	488,680	12,216,998	12,217,015	31,057,400	31,057,500
Pittsburgh Steel Co.	931,048	508,917	7,044,845	4,862,190	12,026,500	16,438,200
Barium Steel Corp.	2,223,402	2,183,769	2,223,402	2,183,769	None	None
Allegheny Ludlum Steel Corp.	1,320,651	1,288,831	8,254,069	8,055,194	10,028,500	10,738,300
Lukens Steel Co.[17]	317,976	317,976	3,179,760	3,179,760	None	None
Detroit Steel Corp.	1,185,793	896,504	1,185,793	896,504	None	None
Granite City Steel Co.	497,201	397,787	11,027,243	8,823,031	None	None
Copperweld Steel Co.	514,864	514,864	2,574,320	2,574,320	1,141,500	1,216,000
Alan Wood Steel Co.	562,202	507,889	5,622,020	5,335,404[22]	6,750,000	6,886,300
Rotary Electric Steel Co.	193,676	193,676	1,936,760	1,936,760	None	None
McLouth Steel Corp.	951,680	475,840	2,379,200	1,189,600	None	None
Midvale Co.	600,000	600,000	10,574,621	10,574,621	None	None
Laclede Steel Co.	206,250	206,250	4,125,000	4,125,000	None	None
Continental Steel Corp.	501,361	501,364	7,018,789	7,018,845	None	None
Keystone Steel & Wire Co.	1,875,000	1,875,000	2,604,167	2,604,167	None	None
Northwestern Steel & Wire Co.[28]	817,825	817,825	4,089,125	4,089,125	None	None
Carpenter Steel Co.[11]	360,000[33]	360,000	1,800,000	1,800,000	None	None
A. M. Byers Co.[31]	264,635	264,635	2,646,350	2,646,350	5,006,800	5,133,900
Total (or average)	84,308,553	**71,855,716**	$1,840,451,214	**$1.806,280,611**	$680,207,729	**$648,572,233**

	Preferred Dividend Requirements 1950	Preferred Dividend Requirements 1949	Net Earnings Per Common Share 1950	Net Earnings Per Common Share 1949	Dividends Per Share on Preferred 1950	Dividends Per Share on Preferred 1949	Dividends Per Share on Common 1950	Dividends Per Share on Common 1949
United States Steel Corp.	$25,219,677	$25,219,677	$7.29	$5.39[4]	$7.00	$7.00	$3.55	$2.15[4]
Bethlehem Steel Corp.	6,537,209	6,537,209	12.15	9.68	7.00	7.00	4.10	2.40
Republic Steel Corp.	1,692,258	1,692,558	10.53	7.54	6.00	6.00	4.25	3.00
Jones & Laughlin Steel Corp.	1,468,000	1,468,000	14.72	7.99	5.00	5.00	2.75	2.60[10]
National Steel Corp.	None	None	7.85	16.02	None	None	2.85	5.50
Armco Steel Corp.	880,609	899,787	11.76	7.68	4.50	4.50	4.00	2.50
Youngstown Sheet & Tube Co.	None	None	12.12	18.97	None	None	3.00	6.00
Inland Steel Co.	None	None	7.76	5.11	None	None	3.50	3.00
Wheeling Steel Corp.	1,807,180	1,815,830	11.59[9]	4.27[9]	5.00	5.00	2.25[9]	4.00
Colorado Fuel & Iron Corp.[11]	447,127	490,954	3.30	8.46	1.00	1.00	1.50	2.00
Sharon Steel Corp.	None	None	10.03	3.59[12]	None	None	3.08	1.33[13]
Kaiser Steel Corp.[14]	2,336,000[14]	[14]	3.00[14]	[14]	[14]	[14]	[14]	[14]
Crucible Steel Co. of America	1,552,855	1,556,855	9.73	0.42*	6.25	4.37½	None	None
Pittsburgh Steel Co.	647,530	863,994	6.13	0.04*	5.50[23]	5.50[23]	None	None
Barium Steel Corp.	None	None	0.66	0.33	None	None	None	[24]
Allegheny Ludlum Steel Corp.	476,454	483,212	7.07	1.15	4.50	4.50	2.50	2.00
Lukens Steel Co.[17]	None	None	6.04	6.07	None	None	1.95	1.05
Detroit Steel Corp.	None	None	7.54	3.53	None	None	2.00	2.00
Granite City Steel Co.	None	None	11.52	7.44	None	None	4.25	2.00[26]
Copperweld Steel Co.	58,033	67,058	4.88[21]	3.24	2.50	2.50	2.00	2.20
Alan Wood Steel Co.	340,908	346,190	3.92	3.76	5.00	5.00	0.60[27]	[27]
Rotary Electric Steel Co.	None	None	11.10	6.65	None	None	2.00	1.50
McLouth Steel Corp.	None	None	6.05	4.49	None	None	[32]	None
Midvale Co.	None	None	0.09	1.82*	None	None	None	None
Laclede Steel Co.	None	None	15.62	13.18	None	None	5.40	5.00
Continental Steel Corp.	None	None	5.31	1.27	None	None	3.30	1.50
Keystone Steel & Wire Co.	None	None	3.45	2.71	None	None	2.05	1.00
Northwestern Steel & Wire Co.[28]	None	None	2.95	2.74	None	None	None	1.25
Carpenter Steel Co.[11]	None	None	8.08	5.58	None	None	[35]	2.00
A. M. Byers Co.[31]	352,700	362,579	0.08*	5.14	7.00	7.00	1.50	1.50
Total (or average)	**$43,816,540**	**$41,803,933**	$8.27	$6.59				

Boldface type is used under those columns in which figures from all 30 companies were not available. NA=Not available.

* Deficit

[1] Excluding amount maturing within one year.

[2] After income taxes.

[3] Including funded debt due within one year.

[4] Based on shares outstanding after 3 for 1 split May 12, 1949.

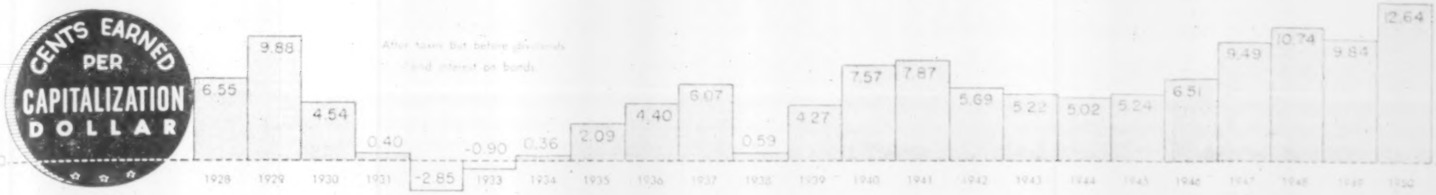
[5] Includes accelerated depreciation of $35,518,128 in 1950 and $22,045,743 in 1949.

[6] Includes accelerated depreciation of $11,325,000 in 1950 and $3 million in 1949.

[7] Includes accelerated depreciation of $5,500,000 in 1950 and $11,850,000 in 1949.

[8] Common shares split 2 for 1 in September, 1950.

[9] Common shares split 2 for 1 Apr. 28, 1950, and 25 per cent stock dividend declared Oct. 25, 1950; 1949 figures restated



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Book Value Per Share of Common Stock		Number of Common Stockholders		Number of Preferred Stockholders		Funded Debt[1]		Surplus		Total Capitalization		Capitaliz Ton Ingot
1950	1949	1950	1949	1950	1949	1950	1949	1950	1949	1950	1949	1950
$63.38	$59.65	197,778	180,274	74,119	76,085	$61,782,446	$65,944,114	$784,561,702	$687,006,870	$2,076,950,118	$1,983,557,281	$61.32
74.95	66.87	75,972	74,876	23,427	24,213	166,064,000	169,564,000	414,796,647	337,348,399	977,709,177	903,760,929	65.18
61.69	55.44	56,255	55,346	7,872	8,110	17,461,903	58,966,653	227,794,948	190,743,325	439,140,217	413,893,311	50.51
106.18	90.26	23,256	22,847	6,364	6,568	71,771,000	60,461,000	172,171,000	130,772,000	377,236,000	321,527,000	77.84
39.63	103.84	NA	NA	None	None	40,000,000	40,000,000	218,108,598	193,480,911	331,729,018	294,829,691	73.72
53.08	45.46	40,202	39,824	4,918	5,500	60,920,000	64,290,000	170,246,663	138,514,113	288,914,391	261,897,665	66.73
81.56[illegible]	144.89	13,203	12,551	None	None	28,500,000	30,000,000	168,167,993	137,601,638	301,756,016	272,689,691	71.00
42.12	37.87	14,722	14,001	None	None	69,250,000	71,250,000	143,881,279	123,013,206	275,631,279	256,763,206	73.50
66.48[9]	56.84[9]	5,944	5,008	4,459	4,508	38,812,000	40,950,000	57,616,244	52,151,413	169,623,166	158,195,963	94.21
49.85	49.01	6,250	5,979	5,050	5,277	11,437,500	11,687,500	53,402,257	50,439,830	82,383,166	77,408,138	55.97
50.92	43.98[12]	5,314	4,708	None	None	8,500,000	9,200,000	37,827,943	34,484,252	55,646,963	49,917,062	38.61
14.38[14]	[14]	14,450[14]	[14]	14,449[14]	[14]	60,000,000[14]	[14]	43,155,228[14]	[14]	116,355,228[14]	[14]	121.96[14]
85.35	76.41	3,124	3,390	6,715	7,043	22,345,000	23,255,000	29,491,047	25,120,762	95,110,445	91,650,277	82.46
41.24	50.17	2,057	1,454	1,838	2,561	4,499,000	5,276,000	34,468,851	26,419,227	58,039,196	52,995,617	54.14
6.76	6.09	12,000	11,000	None	None	None	None	12,810,741	11,112,194	15,034,113	13,295,963	[16]
38.37	32.53	12,602	13,123	2,267	2,526	4,000,000	None	42,419,011	33,865,906	64,701,580	52,659,100	77.73
65.73	61.64	1,454	1,602	None	None	2,870,000	3,509,000	17,721,101	16,419,117	23,770,861	23,107,877	35.22
21.57	14.75	2,035	1,631	None	None	14,475,000	None	24,397,204	12,329,159	40,657,997	13,225,663	60.69
54.31	49.79	2,770	2,200	None	None	5,133,333	1,243,292	15,077,196	10,083,709	32,137,772	21,050,632	51.84
30.86	27.98	3,329	3,103	461	503	1,710,000	None	13,316,680	11,830,017	18,712,500	15,620,337	[16]
29.00	28.28	1,072	793	663	654	5,617,000	6,300,000	10,679,808	9,026,310	28,668,828	27,518,014	52.13
45.73	36.62	749	882	None	None	2,000,000	3,000,000	6,919,348	5,156,530	10,856,108	10,093,290	25.51
16.19	20.28	1,093	800	None	None	17,233,779	21,050,000	13,027,803	8,460,061	32,610,782	30,609,661	NA
27.21	26.31	NA	NA	None	None	None	None	5,751,568	5,209,518	16,326,189	15,781,139	39.09
61.40	51.18	1,183	1,139	None	None	2,042,313	2,177,983	8,539,658	6,430,933	14,706,971	12,733,916	36.97
31.88	29.87	2,673	2,640	None	None	None	None	8,965,065	7,959,104	15,983,851	14,978,249	40.59
10.25	8.84	3,559	3,207	None	None	None	None	16,611,868	13,978,231	19,216,035	16,582,398	59.13
11.22	8.27	950	940	None	None	None	None	5,088,273	2,672,051	9,177,398	6,761,176	28.59
46.21	42.28	2,780	2,650	None	None	None	None	14,653,870	13,420,096	16,633,870	15,220,096	201.45
57.89	59.50	2,111	2,276	1,406	1,474	None	None	12,673,023	13,099,853	20,326,173	20,880,108	[16]
		508,887	**468,244**	154,008	**145,022**	$749,421,274	**$688,124,542**	$2,781,372,617	**$2,308,449,103**	$6,055,535,854	$5,152,326,189	$63.39

Average Number Employed		Total Payrolls		Rated Ingot Capacity, Net Tons		Ingot Production, Net Tons		Steel Operating Rate, Per Cent		Net Income Per Ton Ingots Produced		Net Income Per Ton Ingot Capacity		Normal Incom
1950	1949	1950	1949	1950	1949	1950	1949	1950	1949	1950	1949	1950	1949	1950
288,265	291,163	$1,038,298,489	$925,123,554	33,869,000	32,000,000	31,457,000	25,807,000	98.20	82.50	$6.85	$6.43	$6.36	$5.18	$205,000,000
138,483	133,636	494,738,478	454,833,447	15,000,000	14,200,000	15,116,456	12,596,949	100.77	88.71	8.14	7.88	8.20	6.99	107,000,000
67,079	66,083	247,153,395	207,255,939	8,967,000	8,700,000	8,551,013	6,804,020	98.29	79.12	7.46	6.78	7.33	5.37	65,800,000
42,897	41,516	158,685,000	143,903,000	4,846,500	4,816,500	4,944,000	4,170,000	102.01	86.58	8.04	5.34	8.20	4.62	29,380,000
29,679	28,043	124,135,329	107,843,848	4,500,000	4,200,000	NA	NA	NA	NA	NA	NA	12.85	9.36	52,800,000
27,479	26,539	111,954,462	96,404,964	4,330,000	3,793,000	3,958,727	3,131,020	91.42	82.55	11.87	9.87	10.85	8.15	40,218,159
26,634	25,140	94,261,000	84,601,000	4,250,000	4,082,000	4,124,781	3,478,259	101.00	85.21	9.85	9.14	9.95	7.78	30,535,000
25,483	23,574	102,198,141	88,011,301	3,750,000	3,400,000	3,675,707	3,019,655	102.82	88.81	10.34	8.28	10.63	7.36	35,559,700
15,598	14,849	66,907,861	56,378,771	1,800,000	1,536,000	1,636,475	1,227,600	94.70	79.92	11.19	6.13	10.50	5.11	15,319,000
13,963	14,828	43,689,326	51,168,043	1,472,000	1,472,000	1,198,531	1,446,693	81.42	98.28	3.68	7.01	2.99	6.92	2,701,300
9,850	9,082	36,268,202	28,391,230	1,441,400	1,441,400[13]	1,448,978	1,001,625	100.53	69.49[13]	6.41	3.32	6.41	2.31[13]	8,315,000
4,300	3,800	18,344,000	16,660,500	1,200,000[15]	980,000	1,101,961[14]	884,238	97.69[14]	90.23	10.84	13.13	10.58[14]	11.84	8,100,000
14,558	14,211	54,091,000	42,293,000	1,153,455	1,112,984	NA	NA	NA	NA	NA	NA	5.47	1.22	6,821,436
8,964	9,067	38,288,216	32,306,213	1,072,000	1,072,000	1,074,340	717,253	100.22	66.91	5.91	1.18	5.92	0.79	5,560,000
NA	NA	NA	NA	893,000	406,000[20]	471,095[20]	186,485	54.00	45.93	[18]	[18]		[18]	1,732,912
13,247	11,493	52,215,082	38,269,980	832,360	760,360	701,569	362,813	85.50	57.80	13.99	5.42	11.79	2.59	8,700,000
4,255	4,647	16,135,126	16,500,168	675,000	675,000	621,761	545,253	92.11	80.77	3.09	3.51	2.85	2.86	1,505,834
5,110	721	18,787,314	2,956,913	660,000	None	653,983	None	99.09	[21]	13.67	[21]	13.55	[21]	7,105,779
3,330	2,960	12,596,544	9,885,541	620,000	620,000	681,510	531,821	109.92	85.78	8.10	5.56	9.21	4.77	1,685,000
3,062	2,429	12,856,607	9,441,138	554,400	554,400	NA	NA	NA	NA	[16]	[16]	[16]	[16]	1,800,000
3,461	3,093	12,075,299	10,035,242	550,000	550,000	485,607	381,710	88.29	69.40	5.24	5.91	4.63	4.10	1,745,000
785	580	4,423,445	2,699,003	425,000	420,000	382,764	247,350	90.06	58.89	5.62	5.20	5.06	3.00	1,688,000
1,622	1,093	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4,585,000
1,700	2,050	NA	7,347,839	417,624	449,950	NA	67,647	NA	15.03	NA	16.18	NA	2.43	None
2,713	2,444	9,540,808	7,948,014	397,845	326,025	360,668	283,488	90.66	86.95	8.93	9.59	8.10	8.34	2,842,000
2,633	2,559	10,113,254	7,451,134	394,000	364,000	372,138	239,736	94.45	65.86	7.15	2.66	6.76	1.75	3,220,000
2,203	2,146	10,795,532	9,445,747	325,000	302,400	342,489	308,131	105.38	101.89	18.91	16.50	19.93	16.81	1,880,277
2,255	1,959	8,411,322	7,556,470	321,000	321,000	282,974	288,814	88.15	89.97	8.54	7.77	7.53	6.99	1,590,000
2,578	2,569	10,278,473	11,095,690	81,360	81,360	51,569	55,107	63.38	67.73	56.39	36.46	35.74	21.69	1,672,665
2,735	2,983	7,248,370	9,659,598	NA	NA	[16]	[16]	[16]	[16]	[16]	[16]	[16]	[16]	330,000
764,921	**745,257**	**$2,814,490,275**	**$2,485,467,287**	**94,797,944**	**88,636,379**	**83,696,096**	**67,782,670**	**94.92**	**81.89**	$7.98	$7.05	$7.75	$5.87	$659,276,083

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for comparative purposes.

[10] Includes accelerated depreciation of $403,757 in 1949.

[11] Fiscal years ended June 30.

[12] Restated to show effect of 50 per cent stock dividend in 1950

[13] Revised Jan. 1, 1950.

[14] Corporation publicly refinanced Nov. 1, 1950. To reflect this refinancing, balance sheet items are shown as of Dec. 31, 1950. All other figures shown are for the fiscal year which ends June 30.

[15] Increased to 1,200,000 net tons July 1, 1950 from 1,128,000 net tons.

[16] Not applicable to company's operations.

[17] Fiscal years were 52 weeks ended Oct. 28, 1950, and Oct. 29, 1949.

[18] Includes accelerated depreciation of $280,492 in 1950 and $313,833 in 1949.

Compiled by

STEEL

A PENTON PUBLICATION

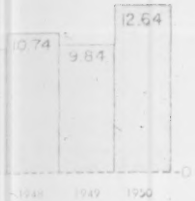
April 30, 1951

[19] Includes $900,000 retained general contingencies

[20] Comparisons would be m include a wire and cable d

[21] In 1950 a prior year's d was credited to income to $100,627

[22] Includes $256,511



THIS SPECIAL REPORT is compiled from data from 30 producers representing 95 per cent of the steelmaking capacity in the United States

Total Capitalization 1950	Total Capitalization 1949	Capitalization Per Ton Ingot Capacity 1950	Capitalization Per Ton Ingot Capacity 1949	Provision For Depreciation, Depletion 1950	Provision For Depreciation, Depletion 1949	Total Income Before Dividends and Interest on Bonds[2] 1950	Total Income Before Dividends and Interest on Bonds[2] 1949	Total Income—Per Cent of Capitalization 1950	Total Income—Per Cent of Capitalization 1949
$2,076,950,418	$1,983,557,281	$61.32	$61.99	$143,938,910[8]	$119,661,652	$217,635,283	$168,206,145	10.48	8.48
977,709,177	903,760,929	65.18	63.65	35,695,998	33,019,014	127,931,459	104,196,206	13.08	11.53
439,440,217	413,893,344	50.51	48.13	29,221,782	18,496,410	65,496,449	48,069,302	14.90	11.61
377,236,000	324,527,000	77.84	67.38	20,727,000	16,684,000	41,558,000	23,984,000	11.02	7.39
331,729,048	294,829,694	73.72	70.20	20,002,683	25,021,857	59,072,117	40,568,413	17.84	13.76
288,944,394	261,897,665	66.73	69.05	10,786,763	9,591,016	48,944,303	32,940,495	16.94	12.58
301,756,046	272,689,691	71.00	66.80	12,457,522	9,980,526	41,441,403	32,602,010	13.73	11.96
275,631,279	256,763,206	73.50	75.52	9,042,156	9,847,447	39,960,039	26,987,306	14.50	10.51
169,623,166	158,195,963	94.24	102.99	6,423,727	6,229,445[10]	19,700,011	9,274,109	11.61	5.86
82,383,166	77,408,438	55.97	52.59	3,436,047	3,165,193	4,894,226	10,535,188	5.94	13.61
55,646,963	49,917,062	38.61	34.63[15]	2,469,755	2,247,580	9,573,329	3,615,201	17.20	7.24
146,355,228[14]	[14]	121.96[14]	[14]	1,897,979	2,877,510	15,643,010	14,739,437	10.69[14]	[14]
95,110,445	91,650,277	82.46	82.35	4,207,299	2,867,842	7,074,255	2,141,873	7.44	2.34
58,039,496	52,995,617	54.14	49.41	1,777,944	2,141,211	6,575,336	1,097,430	11.33	2.07
15,034,113	13,295,963	[16]	[16]	1,003,713	700,248	1,474,226	711,452	9.81	5.35
64,704,580	52,659,400	77.73	69.26	2,752,814	2,216,561	9,814,891	1,967,324	15.17	3.74
23,770,861	23,107,877	35.22	34.23	1,490,878[17]	1,440,877[17]	2,067,214	2,078,511	8.69	8.99
40,657,997	13,225,663	60.69	[18]	1,069,118	517,583	9,328,568	3,166,822	23.29	23.94
32,137,772[19]	21,050,032[19]	51.84	33.95	1,378,270	1,078,815	5,909,642	3,070,138	17.82	14.05
18,712,500	15,620,337	[20]	[20]	652,829	586,092	2,605,739[21]	1,737,506	13.90	11.12
28,668,828	27,518,014	52.13	50.09	1,747,233	1,250,147	2,861,349	2,570,840	9.98	9.33
10,856,108	10,093,290	25.54	21.03	433,353	296,711	2,150,170	1,287,063	19.81	12.75
32,610,782	30,699,661	NA	NA	1,875,099[illegible]	297,774	5,757,343	2,136,123	17.64	6.96
16,326,189	15,784,139	39.09	35.08	384,000	398,000	51,143	1,094,387*	0.31	6.93*
14,706,971	12,733,916	36.97	39.06	684,573	624,765	3,289,139	2,788,928	22.36	21.90
15,983,854	14,978,249	40.59	41.15	601,507	541,498	2,660,153	636,716	16.64	4.25
19,216,035	16,582,398	59.13	54.84	525,493	466,554	6,477,387	5,084,181	33.71	30.66
9,177,398	6,761,176	28.59	21.06	219,306	225,770	2,416,222	2,243,939	26.33	33.19
16,633,870[25]	15,220,096	204.45	187.07	391,596	375,166	2,907,774	2,008,952	17.48	13.20
20,326,173	20,880,108	[16]	[16]	759,760	906,838	331,870	1,724,223	1.63	8.25
$6,055,535,834	$5,452,326,489	$63.39	$61.62	$321,085,167	$273,754,102	$765,602,050	$551,075,446	12.64	9.84

Income Per Ton gots Produced 50	Income Per Ton gots Produced 1949	Net Income Per Ton Ingot Capacity 1950	Net Income Per Ton Ingot Capacity 1949	Normal Federal Income Taxes 1950	Normal Federal Income Taxes 1949	Federal Excess Profits Tax 1950	Total Assets 1950	Total Assets 1949	Current Assets 1950	Current Assets 1949
35	$6.43	$6.36	$5.18	$203,000,000	$126,000,000	$31,000,000	$2,829,186,168	$2,556,365,712	$1,079,338,746	$939,111,579
14	7.88	8.20	6.99	107,000,000	66,500,000	15,000,000	1,314,266,856	1,155,467,610	699,988,462	596,653,036
16	6.78	7.33	5.37	65,800,000	35,000,000	13,400,000	552,077,875	496,092,781	257,905,476	222,158,046
31	5.34	8.20	4.62	29,380,000	13,150,000	4,470,000	466,322,000	381,098,000	208,118,000	147,140,000
A	NA	12.85	9.36	52,800,000	37,400,000	8,300,000	419,808,189	360,479,057	219,994,188	168,373,351
37	9.87	10.85	8.15	40,248,159	19,315,315	7,925,069	383,040,519	314,745,021	197,824,543	155,244,414
85	9.14	9.95	7.78	30,535,000	19,894,000	3,285,000	381,896,152	326,977,993	248,855,884	213,002,502
34	8.28	10.63	7.36	35,559,700	15,935,000	5,665,000	356,465,586	300,667,729	197,596,157	151,287,708
19	6.43	10.60	5.14	15,319,000	5,807,752	2,023,000	190,801,447	173,271,659	78,764,860	63,651,900
38	7.01	2.99	6.92	2,704,300	6,059,200	None	102,250,338	97,131,281	45,023,240	42,350,023
11	3.32	6.41	2.31[15]	8,345,000	1,650,000	1,600,000	72,465,756	61,883,294	48,077,116	36,358,974
34	13.13	10.58[14]	11.84	8,100,000	7,159,670	None	159,938,806[14]	130,715,558	34,741,356[14]	30,820,780
A	NA	5.47	1.22	6,821,436	351,827	1,379,087	120,097,495	104,221,987	57,455,045	41,361,337
91	1.18	5.92	0.79	5,560,000	624,000	950,000	78,170,737	63,723,373	41,741,436	29,510,346
*	[18]	[18]	[18]	1,752,942	809,462	312,000	32,123,125	25,961,596	16,220,720	10,356,721
39	5.42	11.79	2.59	8,700,000	1,200,000	1,550,000	95,192,254	67,899,858	56,159,740	32,908,076
99	3.54	2.85	2.86	1,505,831	1,640,330	None	31,423,862	28,414,852	21,111,834	16,697,672
57	[18]	13.55	[18]	7,105,770	1,920,000	1,510,000	57,651,187	16,905,101	32,124,481	9,737,192
10	5.56	9.24	4.77	4,685,000	1,890,000	735,000	44,229,179	29,690,036	26,516,615	15,064,088
*	[20]	[20]	[20]	1,800,000	905,581	None	25,653,651	18,975,748	16,328,463	11,867,454
24	5.91	4.63	4.10	1,745,000	1,480,000	None	35,801,254	32,727,600	12,390,719	10,002,040
52	5.20	5.06	3.06	1,688,000	955,000	222,000	12,956,394	11,712,572	4,394,222	4,616,689
A	NA	NA	NA	4,585,000	1,260,000	855,000	45,490,508	36,482,630	19,240,687	9,711,474
A	16.18*	NA	2.43*	None	None	None	18,258,496	17,090,359	11,562,219	10,882,494
93	9.59	8.10	8.34	2,843,000	1,800,870	540,000	19,117,241	15,356,772	11,302,557	8,382,568
15	2.66	6.76	1.75	3,220,000	785,000	None	21,743,005	17,352,188	10,495,400	8,991,014
91	16.50	19.93	16.81	4,880,277	2,600,053	729,444	23,143,219	20,060,566	10,997,106	8,633,383
54	7.77	7.53	6.99	1,590,000	1,195,000	None	13,470,209	9,927,159	6,958,641	5,949,815
39	36.16	35.74	24.69	1,672,665	1,227,224	None	21,930,857	18,555,721	15,955,188	12,685,296
*	[18]	[18]	[18]	330,000	1,100,000	None	23,458,616	23,868,141	9,770,619	9,935,067
98	$7.05	$7.75	$5.87	$659,276,083	$375,615,284	$101,450,600	$7,948,430,981	$6,913,821,954	$3,696,953,720	$3,023,445,039

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[19] Includes $900,000 retained in the business to provide for general contingencies.

[20] Comparisons would be misleading as company's operations include a wire and cable division with no steel ingot capacity.

[21] In 1950 a prior year's depreciation adjustment of $353,498 was credited to income. Applicable income taxes amounted to $100,627.

[22] Includes $256,514 common stock and scrip issuable in 1950 for stock dividends.

[23] Payment on prior preferred; payment on class A preferred $5.00 in 1950, $6.25 in 1949; no payments either year on class B preferred.

[24] Ten per cent stock dividend.

[25] Capacity of 450,000 net tons acquired in 1949 from Phoenix Iron & Steel Co., but inoperative until March, 1950.

[26] Plus 4 per cent stock dividend paid Dec. 23, 1949.

Financial Analysis

OF THE STEEL INDUSTRY FOR 1950

er tion	Net Sales		Net Profit—Per Cent of Net Sales		Net Income Before Dividends		
49	1950	1949	1950	1949	1950	1949	
48	$2,956,406,146	$2,301,685,689	7.29	7.21	$215,464,142	$165,908,829	United States Steel Corp.
53	1,415,404,331	1,271,040,076	8.51	7.81	122,976,071	99,283,539	Bethlehem Steel Corp.
61	881,753,328	651,952,835	7.23	7.08	63,794,711	46,142,323	Republic Steel Corp.
39	487,451,000	386,046,000	8.15	5.76	39,744,000	22,218,000	Jones & Laughlin Steel Corp.
76	537,024,673	424,892,845	10.77	9.25	57,814,974	39,311,269	National Steel Corp.
58	439,296,931	341,350,147	10.70	9.06	47,000,505	30,918,202	Armco Steel Corp.
96	409,898,010	338,344,004	9.91	9.39	40,616,403	31,777,010	Youngstown Sheet & Tube Co.
51	461,376,600	347,640,710	8.24	7.20	38,015,676	25,013,707	Inland Steel Co.
86	186,723,442	144,382,844	9.81	5.47	18,314,517	7,896,265	Wheeling Steel Corp.
61	112,642,939	138,344,200	3.91	7.36	4,406,226	10,182,919	[11]Colorado Fuel & Iron Corp.
24	136,120,769	90,068,564	6.82	3.69	9,284,643	3,325,964	Sharon Steel Corp.
	84,782,677	75,244,735	14.08	15.43	11,940,593	11,606,985	[14]Kaiser Steel Corp.
34	147,807,941	100,336,614	4.27	1.35	6,311,254	1,352,765	Crucible Steel Co. of America
07	119,185,237	80,559,351	5.33	1.05	6,350,410	844,810	Pittsburgh Steel Co.
35	53,523,876	33,885,545	2.75	2.10	1,474,226	711,452	Barium Steel Corp.
74	177,961,693	105,863,359	5.52	1.86	9,814,891	1,967,324	Allegheny Ludlum Steel Corp.
99	52,935,861	55,825,306	3.63	3.46	1,922,037	1,930,045	[11]Lukens Steel Co.
94	92,949,234	28,007,570	9.62	11.31	8,943,140	3,166,822	Detroit Steel Corp.
05	60,234,883	46,496,523	9.51	6.36	5,727,406	2,958,109	Granite City Steel Co.
12	55,596,047	42,708,329	4.63	4.07	2,572,539[29]	1,737,506	Copperweld Steel Co.
33	44,954,826	35,895,460	5.67	6.28	2,546,902	2,255,840	Alan Wood Steel Co.
75	31,103,586	16,865,512	6.91	7.63	2,150,170	1,287,063	Rotary Electric Steel Co.
96	NA	NA	NA	NA	5,757,343	2,136,123	McLouth Steel Corp.
93*	11,394,397	13,739,443	0.45	7.97*	51,143	1,094,387*	Midvale Co.
00	39,615,464	31,209,110	8.13	8.71	3,222,475	2,718,352	Laclede Steel Co.
25	36,428,123	22,505,562	7.30	2.83	2,660,153	636,716	Continental Steel Corp.
56	43,206,187	36,735,489	14.99	13.84	6,477,387	5,084,181	Keystone Steel & Wire Co.
9	31,670,308	28,564,916	7.63	7.86	2,416,222	2,243,939	[28]Northwestern Steel & Wire Co.
20	25,956,366	26,531,036	11.20	7.57	2,907,774	2,008,952	[11]Carpenter Steel Co.
25	20,724,330	29,347,046	1.63	5.87	331,870	1,724,223	[31]A. M. Byers Co.
4	**$9,184,129,205**	**$7,246,068,820**	**8.01**	**7.25**	$741,009,803	$527,284,847	Total (or average)

	Current Liabilities[3]		Ratio of Current Assets to Current Liabilities		Working Capital		
	1950	1949	1950	1949	1950	1949	
79	$637,520,293	$455,267,896	1.69—1	2.06—1	$441,818,453	$483,843,683	United States Steel Corp.
36	298,807,679	214,241,303	2.34—1	2.78—1	401,180,783	382,411,733	Bethlehem Steel Corp.
46	94,492,805	66,070,859	2.73—1	3.36—1	163,412,671	156,087,187	Republic Steel Corp.
00	85,358,000	50,717,000	2.44—1	2.90—1	122,760,000	96,423,000	Jones & Laughlin Steel Corp.
51	58,703,383	39,331,329	3.75—1	4.28—1	161,290,805	129,042,022	National Steel Corp.
14	88,622,484	48,032,617	2.23—1	3.23—1	109,202,059	107,211,797	Armco Steel Corp.
02	70,939,782	46,065,651	3.51—1	4.62—1	177,916,102	166,936,851	Youngstown Sheet & Tube Co.
08	69,860,014	35,653,147	2.83—1	4.24—1	127,736,143	115,634,561	Inland Steel Co.
00	16,314,815	11,475,725	4.83—1	5.55—1	62,450,045	52,176,175	Wheeling Steel Corp.
23	16,031,277	17,351,929	2.81—1	2.44—1	28,991,963	24,998,094	[11]Colorado Fuel & Iron Corp.
74	15,843,793	11,966,232	3.03—1	3.04—1	32,233,323	24,392,742	Sharon Steel Corp.
80	13,793,220[14]	17,877,248	2.52—1[14]	1.72—1	20,948,136	12,943,532	[14]Kaiser Steel Corp.
37	22,040,415	10,819,845	2.61—1	3.84—1	35,414,630	30,541,492	Crucible Steel Co. of America
46	17,160,290	7,829,880	2.43—1	3.77—1	24,581,146	21,680,466	Pittsburgh Steel Co.
21	11,347,562	5,766,778	1.43—1	1.80—1	4,873,158	4,589,943	Barium Steel Corp.
76	26,170,103	10,961,399	2.15—1	3.00—1	29,989,637	21,946,677	Allegheny Ludlum Steel Corp.
72	6,810,273	4,463,040	3.10—1	3.74—1	14,301,561	12,234,632	[11]Lukens Steel Co.
92	17,241,727	3,679,439	1.87—1	2.65—1	14,882,754	6,057,753	Detroit Steel Corp.
88	11,340,407	8,340,004	2.34—1	1.82—1	15,176,208	6,724,084	Granite City Steel Co.
54	6,449,770	2,853,018	2.53—1	4.16—1	9,878,693	9,014,436	Copperweld Steel Co.
10	6,534,881	4,624,296	1.90—1	2.16—1	5,855,838	5,377,744	Alan Wood Steel Co.
89	2,100,286	1,619,282	2.09—1	2.85—1	2,293,936	2,997,407	Rotary Electric Steel Co.
74	12,849,726	5,782,969	1.50—1	1.47—1	6,390,961	3,928,505	McLouth Steel Corp.
94	1,700,136	1,006,879	6.80—1	10.81—1	9,862,083	9,875,615	Midvale Co.
68	4,160,270	2,372,856	2.72—1	3.53—1	7,142,287	6,009,712	Laclede Steel Co.
14	5,087,612	1,746,629	2.06—1	5.13—1	5,407,788	7,244,385	Continental Steel Corp.
83	3,756,236	2,920,402	2.93—1	2.96—1	7,240,870	5,712,981	Keystone Steel & Wire Co.
15	3,510,037	3,165,983	1.98—1	1.88—1	3,448,604	2,783,832	[28]Northwestern Steel & Wire Co.
96	4,871,387	2,909,006	3.28—1	4.36—1	11,083,801	9,776,290	[11]Carpenter Steel Co.
67	2,858,811	2,698,264	3.42—1	3.68—1	6,911,808	7,236,803	[31]A. M. Byers Co.
39	$1,632,277,474	$1,097,610,905	2.26—1	2.75—1	$2,064,676,246	$1,925,834,134	Total (or average)

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[27] In addition to one 5 per cent stock dividend in 1950; two 5 per cent stock dividends declared in 1949.

[28] Fiscal years ended July 31.

[29] Includes $180,000 credited to capital stock for common stock dividend.

[30] Plus 5 per cent stock dividend paid July 1, 1949.

[31] Fiscal years ended Sept. 30.

[32] Stock dividend of 100 per cent issued Sept. 29, 1950.

[33] Includes accelerated depreciation of $553,000.

[34] Includes accelerated depreciation of $1,450,650.

[35] Ten per cent stock dividend declared June 29, 1950. Cash dividends amounted to $2.50 per share on 360,000 shares and $1.50 per share on 396,000 shares.

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CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to U. S. Commerce Department, Division of Printing Services, attention E. E. Vivian, Room 6225 Commerce Bldg., Washington 25. For ESA orders, write J. L. Miller, Economic Stabilization Agency, Room H367, Temporary E. Bldg., Washington 25.

Materials Orders

BINDER & BALER TWINE—M-58, effective Apr. 19, 1951, limits distributors' and farmers' inventories of binder and baler twine.

PLASTIC TYPE NYLON—Schedule 4 to NPA Order M-45 puts plastic type nylon under NPA allocation. Schedule 4 is effective Apr. 20, 1951.

ALUMINUM—Amendment of Apr. 20, 1951, of NPA Order M-7 permits limited use of aluminum during May and June in the manufacture of more than 200 consumer items in which the use was to have ceased May 1. During those two months, producers of those items will be permitted to use 50 per cent as much aluminum as they used in the average month of the first half of 1950. During April, the permitted percentage was 65.

PAPER—Amendment of Apr. 20, 1951, of NPA Order M-36 revises the amounts of paper which mills must set aside for filling essential government orders. In some instances there are increases, in some there are decreases, and in some there is no change.

IRON & STEEL—Amendment of Apr. 24, 1951, of NPA Order 47 exempts from the 80 per cent restriction on use of iron and steel the following five groups: Medical, dental and hospital specialties; pens and mechanical pencils; table tops for kitchen, dinette and breakfast tables; ornamental lawn fence and railing; and miscellaneous items such as shoe trees. Amendment effective April 24, 1951.

CANS—Amendment of Apr. 24, 1951, of NPA Order M-25 permits use of tin plate for one end of small black plate cans for packing whole, dried or skimmed milk. Amendment effective Apr. 24, 1951.

NPA Regulation

APPEALS—NPA Regulation 5 effective Apr. 25, 1951, establishes a three-man board to hear appeals for adjustment under NPA orders and regulations. T. Munford Boyd, on leave as professor of law at the University of Virginia, was named chairman. Other two members are Frank J. Peterson and Jack M. Rorimer, former WPB officials.

Price Regulation

IRON & STEEL SCRAP—Amendment 2 of Ceiling Price Regulation 5 permits payment of premiums for specialty grades of iron and steel scrap, frees railroads from need to absorb cost of transporting their cast iron scrap when shipped on their own lines to a purchaser, and makes minor rollbacks in the price of slag scrap and slight increases in fees for preparing certain grades. Amendment was effective Apr. 24, 1951.

New Limits Put on Scrap Use

New limits on the use of iron and steel scrap were set up by the National Production Administration to channel available supplies of specified grades to operations where they are most needed.

In directives to operators of specified types of steel furnaces NPA stipulated they must refrain from using grades of iron and steel scrap which could be utilized more effectively in other types of furnace operations.

The directives: 1. Reserve certain grades of cast iron scrap for use in foundries and prohibit their use in basic open-hearth operations; 2. ban the use of electric furnace grades of iron and steel scrap from use in basic open-hearth operations; and 3. prohibit the use of foundry grades of scrap in open-hearth or electric furnace operations.

Scrap grades listed in the directive are defined in Ceiling Price Regulation 5 of the Office of Price Stabilization.

Don't Make Reports If—

If you were in business in 1950 you don't have to make reports to National Production Authority of quarterly quotas on material used for maintenance, repair and operating supplies.

Some organizations, apparently misunderstanding Section 4 of NPA Regulation 4, have gone to the unnecessary expense and bother of continuing to make reports, NPA said. This is the regulation that permits the use of DO-97 ratings for procurement of MRO supplies.

Only new companies which were not in operation last year or were only in partial operation need make these MRO reports, NPA pointed out.

Assignments of DO Ratings

(As of April 19; subject to change without notice)

Code No. & Agency	Major Program Involved
01 Defense	Aircraft
02 Defense	Guided Missiles
03 Defense	Ships
04 Defense	Tanks—Automotive
05 Defense	Weapons
06 Defense	Ammunition
07 Defense	Electronics, Communication Equipment
08 Defense	Fuels, Lubricants
09 Defense	Clothing, Equipage
10 Defense	Transportation Equipment
11 Defense	Building Supplies, Equipment for Overseas Construction
12 Defense	Subsistence
19 Defense	Production Equipment
21 Defense	Miscellaneous
22 Defense	Contract Construction
35 NPA for ECA	Foreign Additional Military Production
36 NPA for ECA	Foreign Nonmilitary Production
37 NPA for OIT	Foreign other than ECA, Nonmilitary
38 NPA	U. S. Transportation Equipment
40 AEC	Operation
41 AEC	Construction
42 AEC	Construction Equipment
43 AEC	Privately Owned Facilities
45 NPA, CAA, NACA	Miscellaneous
46 NPA	Industry Plant Expansion
47 NPA	All Canadian Programs
48 Interior	All Programs
49 State	Voice of America
60 Coast Guard	Miscellaneous
61 Coast Guard	Aircraft
62 Coast Guard	Construction
63 Coast Guard	Ships
63 NPA	Steel Shipping Containers
75 NPA	Mining Machinery
87 NPA or Delegatee	Farm Machinery
90 NPA	U. S. Transportation Equipment
91 NPA	U. S. Transportation Equipment
92 NPA	U. S. Transportation Equipment
94 NPA	Oil Field Equipment
97 NPA or Delegatee	Maintenance, Repair, Operating Supplies
98 NPA or Delegatee	Production Equipment for Certain Private Contractors
99 NPA or Delegatee	Basketing (Consolidation of Small Orders as provided in NPA Reg. 2)

Getting Your Materials: More Method

Z & W Machine Products thinks many small companies may have an Aladdin's lamp that will help them solve materials shortages. The magic is to recognize it and rub it hard

STEEL
HOW A SMALL INDUSTRY IS LICKING
Materials Problems
PARTS FOR PEACE
PARTS FOR WAR

Paint sprayers and altimeter antennas—Z & W Machine Products Inc. makes both. There's a dividing line between them because one product is for peace, the other for defense; Z & W finds civilian and defense jobs work out well as a 50-50 proposition

SIXTEEN years ago the infant Z & W Machine Products Inc. could get plenty of materials, but not much business. Today the Cleveland company can get plenty of business, but materials are the problem.

Z & W's approach to the solution for both those seemingly opposite difficulties is the same: Do the tough jobs that few other companies are willing to undertake. In the 1930s that meant accepting the rugged contracts requiring rigid tolerances and the machining of stainless steel. Today that means accepting a certain amount of government regimentation and peculiarities in doing business to have the defense contracts and ratings for scarce materials.

Magic Lantern? — The Aladdin's Lamp Z & W touched to help solve its materials and conversion problems can be rubbed by you, too. For there's far more method than magic in Z & W's approach. Here's what it advises you to do: Determine if you have to go into defense work to assure yourself enough materials to stay in operation. Figure what will happen to your position in civilian fields if you devote part of your output to defense. If you decide you will have to go into war work, determine the minimum you will have to do to get enough materials. Analyze your company's equipment to determine your versatility as to just what defense products or essential civilian lines you can make. Finally, if you have decided to go into defense work, plan a sales campaign to get that type of business.

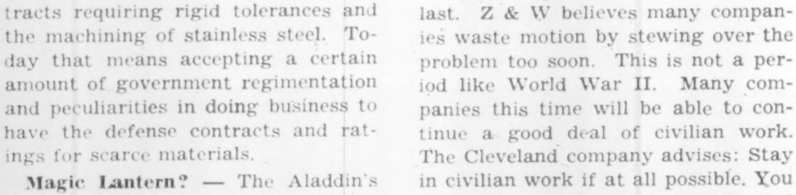
That last point should be left until last. Z & W believes many companies waste motion by stewing over the problem too soon. This is not a period like World War II. Many companies this time will be able to continue a good deal of civilian work. The Cleveland company advises: Stay in civilian work if at all possible. You may be ill-suited for defense jobs and may run into more troubles in conversion than if you stayed in your civilian line and kept wrestling with materials shortages. There is no set of rules to determine whether a company should convert or not; but you should think twice about the step if you are not equipped or experienced in producing to close, rigid tolerances, or if your equipment is designed for special limited purposes and cannot be readily modified for military products.

The Pros and Cons — Z & W weighed all these matters and decided that it had to convert to get the materials. But it resolved to keep as much peace work as possible to hold its competitive position.

The company was incorporated in 1935 by G. W. Walker, president, F. A. Ziherl, vice president, and L. A. Ziherl, secretary and treasurer. Basically it is a screw machine products house, although it also has an electronics division that further adds to the diversity inherent in a screw machine products producer. The electronics end grew out of a decision to make the motors for an electric sprayer which was and still is one of its main civilian items. The firm's diversity was the main factor that convinced the Ziherl brothers and Mr. Walker that they could successfully convert.

The factor that convinced them that they had to convert was the smallness of their company. They reasoned that they wouldn't have a chance for materials without priorities because Z & W is a relatively small consumer — about 350,000 pounds of steel a month, about 50,000 pounds of aluminum and 161,000 pounds of brass. The owners employ only a few more than 100 production workers. The company had gross sales of $2 million in 1950. Its peak in World War II was $1.5 million.

Half and Half—It has about 30 civilian products which it still builds. In normal times, about 70 per cent of its business is as a job shop. The major civilian lines are blow torches, electric paint sprayers, various types of hand sprayers, a line of tool and tap holders, reamers, a patented cocktail shaker, automotive fittings and



DEFENSE WORK ISN'T A GREAT HELP IN GETTING NEW MACHINERY
. . . Z & W's machinists rebuild older equipment

od Than Magic

quick attachable and detachable hose ends. About 40 per cent of its civilian work is in stainless steel. Currently about half its work is civilian, about half defense. That ratio can vary from time to time according to business and international situations. Z & W considers itself fortunate in that it can bend a little with the prevailing breeze; it hopes it won't have to go much higher than 50 per cent defense, but fears that it may be forced to.

Z & W is now working on several hundred components involved in about 20 prime contracts. All those jobs are subcontracts; it has only four prime contracts—all in development work. Although the company works on a wide range of defense contracts, its major defense products are altimeter antennas, ordnance components, hose fittings and valves for aircraft, and reciprocating and jet engine components. It makes as many as 50 component parts for one jet engine job.

While the defense contracts help get materials, they don't solve the manpower difficulties. Z & W can't find enough of the highly skilled help it requires, so it works two 10-hour shifts a day, six days a week. Nor are defense contracts a great help in getting new machinery. The company doesn't care to pay the prices for some of the new machinery quickly obtainable today, so has to buy used machinery or parts of machinery. Its machinists rebuild the equipment at the Z & W plant. Z & W has 26 multiple spindle automatic screw machines, 12 Brown & Sharpe single units and much other equipment. Nor are purchasing problems completely smoothed over. Two men once handled the buying job alone. Now one other does it part time, as do all the sales personnel.

Flies in the Ointment — Defense contracts also mean a lot of added trouble: Higher clerical costs, frequent government inspections, tough specification requirements that necessitate added equipment. Z & W is shifting gradually to electronic inspection units.

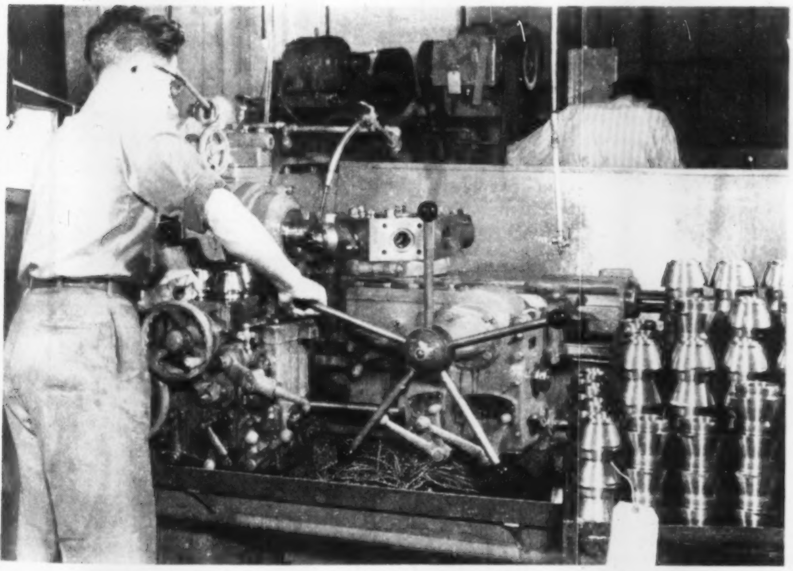
Once Z & W had made the decision to go into military work, it had to get the business. "It is essentially the same as getting civilian contracts," says Louis Ziherl. "We get our new business in this manner: Through old World War II contacts; through missionary calls the salesmen make on regular contacts; through contacting prime contractors; by working with prime contracts in the engineering and development phases of a job; and by various types of advertising.

It Pays To Advertise—One phase of Z & W's campaign to advertise for defense jobs is a brochure sent to companies and government agencies from whom it might get business. Z & W says a brochure should give general information about your company; sketch the history of your firm; list officers and their backgrounds; describe your buildings and facilities; give your balance sheet and an interpretation of your financial conditions; list all or as many as possible of those items you do or can manufacture as well as any related services which can be performed by you; show why your plant is ideally located, why your facilities are superior and how an expansion program if necessary, can be accomplished; contain all catalog, technical and engineering literature that you have drawn for advertising purposes. Z & W says: "In all cases give as much information as possible. Do not try to be too brief."

PEACETIME OUTPUT CONTINUES
. . . threading sprayer tubes

Be Prepared—A mistake some companies make in seeking defense business is to be too reticent in their brochures and other presentations about their equipment, financial status and capacity. Z & W gives the complete story in its booklet, but limits the distribution of data to only those government agencies and prime contractors with whom it believes it has a good chance of doing business. Thus far, persons to whom the information has been released have always kept it in confidence.

How has Z & W made out by rubbing its Aladdin's lamp? It is now doing business at the annual gross sales rate of $3.5 million a year, compared with $2 million in 1950. It has just bought a new plant across the street—necessitated both by increased war and peace work—which will more than triple its floor area. You, too, may have an Aladdin's lamp—the magic is to recognize it soon enough and to rub it hard enough.

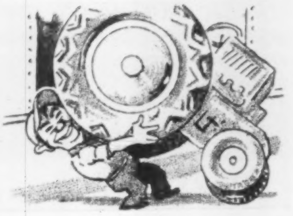


BIG NEED: SKILLED WORKERS FOR SKILLED JOBS
. . . machining ordnance components on a turret lathe

Windows of Washington

By E. C. KREUTZBERG Washington Editor

LABOR DOMINATES BOARD
. . . frowns from employers



LIGHTER MACHINERY
. . . easier air transport

DETERRENT TO EXPANSION
. . . for excess in the past

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THE ARIZONA TAP
. . . turned off

THE WHITE HOUSE'S way of bringing labor back into the Wage Stabilization Board has brought frowns from employer representatives in Washington and smirks to labor's representatives. Indignant employer representatives say the conduct of the administration amounts to a complete capitulation to the labor group, a rank discrimination against management. Smiling labor people tell STEEL "the trouble has been straightened out." They're satisfied.

With a Velvet Glove—There are no two ways about it: A Wage Stabilization Board appointed by the President is going to handle labor with a gentle hand, if not velvet gloves. But employer spokesmen don't seem to have any intention of objecting to the new WSB setup right now, even though they do not regard it as a legal instrument under the Defense Production Act. They think it is extra-legal because Title V of the act authorizes the President to call a conference of representatives of management, labor and the public to reach agreements on acceptable procedures in settling labor disputes. Thereafter, action is to be taken on the basis of the agreement of the three groups.

There have been no such conferences.

Even the Justice Department has let it be known that authorization of WSB to act in dispute cases is extra-legal because there were no conferences.

Although things may lie quietly for awhile, you can expect to hear squawks from companies involved in cases that the board will handle in the future. And the board's authority is sure to be questioned.

For Those Far Away Places . . .

The trend toward lightening the weight of equipment so that it can more readily be transported by air is being pushed by the Air Force. So far it has succeeded in getting many items redesigned by manufacturers to facilitate flying it to remote parts of the world. Now demands of this kind also are coming from other countries as a result of technological advice from United States missions operating under the Point Four assistance program. Latest such development involves Bolivia where a Civil Aeronautics Administration mission is helping to lay out new air fields. CAA approached U. S. builders of large earth-moving apparatus about making such machinery smaller and lighter, so that it can be flown to out-of-the-way airfield sites.

Careful About Expansion . . .

Will your expansion program, if approved, lead to duplication of existing facilities that you could employ on a subcontracting basis? That question now is being applied strictly by the NPA in determining what applications for certificates of necessity should have affirmative action. In World War II, says an NPA spokesman, the government was careless in permitting expansions "that could have been avoided had the subcontracting potentials been exploited. Because of the carelessness many large firms emerged from the war with facilities for doing work that had been done by small firms before the war. This time, you will not be encouraged to expand through the aid of rapid amortization if you can get the work done by subcontractors. Fast amortization will not be used to drive small firms out of business either now or after termination of the present emergency.

Arizona Project Trickles Out . . .

The so-called Central Arizona Project is dead for this session of Congress. The House Committee on Interior & Insular Affairs voted to postpone further consideration of the bill, H. R. 1500, until use of water in the lower Colorado river basin is adjudicated or until the lower basin states reach a binding mutual agreement on the use of the water. The huge project calls for a dam and incidental works in the main stream of the Colorado river at Bridge Canyon.

Who Will Direct Expansion?

Who in the NPA will direct the iron and steel expansion program—particularly, in determining when, where and how priority assistance in obtaining equipment is to be given? The two candidates are Frank Creedon's Facilities & Construction Bureau and Melvin W. Cole's Iron & Steel Division. The former thinks one unit should handle all expansion programs in all industries. The latter feels that expansion in each industry should be directed by the industry unit in NPA. Iron and steel men, of course, want the iron and steel expansion program to be administered by the Iron & Steel Division.

For Your Convenience . . .

For the convenience of businessmen visiting Washington, the Central Military Procurement Information Office of the Munitions Board was moved from The Pentagon to 334 Old Post Office Bldg., 12th and Pennsylvania Ave. N.W., Washington. Telephone number is LIberty 5-6700, Extension 66151.

No Big Splash in Pools . . .

Although some 30 applications are in from groups of companies wanting clearance under the antitrust law so they may form pools for contracting and subcontracting purposes, NPA hasn't acted on any of them at this date.

The reason for it is the inability on the part of government lawyers to agree to a course of procedure that will conform to the language of the Defense Production Act. Then, too, there is a disposition to discourage formation of pools; the feeling is that World War II experience with contracting pools was not too good.

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

The Detroit transit strike was proof of automakers' thesis that the automobile is essential to the U. S. economy and should be considered as such in defense planning

DETROIT

FOR THOSE who refer to passenger cars as "pleasure" cars, Detroit now has a good object lesson to give. It is: Don't let anything interfere with size or function of the private passenger car fleet or the city will be immobilized. Its public transportation system was put out of commission by a strike last week, but the city carried on with private autos.

Although not without inconvenience and some loss in production, the switch from street car and bus riding to private transportation for roughly 25 per cent of Detroit's working population was accomplished. The switch in reverse—from cars to public transportation—could not have been accomplished.

Defense Link—The essentiality of passenger cars has repeatedly been borne out by studies made by government agencies and by automotive interests. In one postwar survey of 35 cities in four population classifications, it was shown that only 13.5 per cent of the people traveled by public conveyance. In large cities the percentage was, of course, much higher, amounting to 53.8 per cent in one instance and averaging 39.7 per cent in seven cities with populations in excess of 250,000. Decentralization of industry and growth of suburban population, however, are tending to increase dependency on private automobiles still further.

These and similar facts continue to be impressed on officialdom in Washington and on the public at large with the result, already noticeable, that none of the automakers has any doubt but that production of cars for civilians will be permitted. Most automen believe even all-out war would not bring complete cessation of production. In spite of being excluded in the original controlled materials plan and having varied reaction to that exclusion (STEEL, Apr. 23, p. 53), the automakers are now catching broad hints from their Washington listening posts that the plan may in fact be opened up to them. NPA believes consumer durable goods production can continue at a decent level without its intervention. If this starts to look unlikely, however, (and the tip-off will be the unemployment trend) fast coverage by CMP's umbrella is expected.

Special Case — Automakers have by now become used to being treated differently. Starting with ESA's rollback of 1951 auto prices to the 1950 level and continuing with the exclusion of cars in its general manufacturers regulation of last week, Office of Price Stabilization has treated the industry as a specialized problem and most of the solutions which have been worked out for it have been tagged "temporary." Extension of the present interim order after May 1 is looked for although there may be provision made so that dealers can regain their normal markup percentage. Amendment 1 to CPR 1, of course, permitted a 3.5 per cent increase in automakers' prices but prohibited dealers from raising their prices in excess of the dollars-and-cents increase to them. That still rankles.

In Detroit last Monday to address the economic club, Price Boss Michael V. DiSalle, talking about the new regulation which will permit markups to compensate for higher raw material costs, said it will bring relief to makers of automotive parts and many other manufacturers. But "the net effect of the regulation will be price rollbacks. Most manufacturers will not be able to increase prices."

Auto, Truck Output

U. S. and Canada

	1951	1950
January	645,688	609,878
February	658,918	505,593
March	791,884*	610,680
April		585,705
May		732,161
June		897,853
July		746,801
August		842,335
September		760,847
October		796,010
November		633,874
December		671,622

Weekly Estimates

Week Ended	1951	1950
Mar. 31	184,469	139,821
Apr. 7	158,076	133,172
Apr. 14	162,839	147,240
Apr. 21	165,477	151,613
Apr. 28	160,000	148,274

Estimates by Ward's Automotive Reports

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* Preliminary.

New and Used Car Sales Slack

The dullness in car sales, especially used cars but also prevalent in new cars of many makes, continues to distress dealers whose prime complaint is against the terms of Regulation W. Representatives of the National Automobile Dealers Association took their woes to the new chairman of the Federal Reserve Board recently and explained that spot checks confirming general reports "show that inventories of both new and used cars are increasing at an alarming rate due largely to the fact that many who urgently need dependable cars are unable to meet the currently stringent terms imposed by Regulation W." NADA's weekly news letter to members indicates that more facts and figures on the situation are being gathered for later presentation to the FRB.

Independents Do Well

Tight supply of automaking materials is usually thought to operate more against the independents than the big three. Hearing many of them talk in this vein certainly helps implant this belief. So statistics compiled by *Ward's Automotive Reports* are surprising.

During first quarter of this year the independents' percentage of industry production of passenger cars in United States plants was the highest since first quarter two years ago. It was two percentage points above the period when Chrysler was out of the running with its strike of last year. *Ward's* figures that 253,718 passenger cars, or 15.78 per cent, were produced by the seven independent makers last quarter. Output by this group was 3 per cent higher than achieved in their peak quarter's production last year. At the same time, the big three's turnout of 1,354,283 passenger cars was 20 per cent under the top quarter of last year.

Letting down slightly this quarter, the independents are still expected to turn in a superior performance,

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capturing an estimated 14.15 per cent of the industry's total by producing 222,000 cars. General Motors, Ford and Chrysler, *Ward's* expects, may produce in U. S. plants 1,347,000 cars. Second quarter on this basis would show 1,569,000 cars against 1,608,001 in first quarter.

Worst Shortage: Alloy Bars

Taking into account the spectacular ingenuity which the industry has demonstrated time after time when it overcomes materials shortages, it is hard to see how it can get around the most serious one facing it now—lack of hot and cold alloy bars. Attracting top-level considerations and requiring an unprecedented amount of co-operative effort between fabricators and automakers, the problem is expected to reach its most acute stage within the next two months.

Two truck makers reportedly will exhaust their inventories and will be closed tight for lack of bars. If billets were available, which they are not, some users say they would still be unable to book rolling space, and mills with heavy DO booking can offer little or no relief. An unusual incident, which at this moment certainly doesn't mark the beginning of a trend and defies explanation, is that one mill in scheduling June and July bar rollings has asked its automotive customers to make no reduction in their orders. Ostensibly the reason is concern over the possibility that the automakers will reduce their consumption for lack of car demand.

Olds Boosts Hardtop Output

Production of Oldsmobile's super "88" Holiday coupe, its hardtop convertible in that series, is being stepped up with May schedules calling for four times April's output. June's production is scheduled to rise 150 per cent over May, according to Oldsmobile General Manager J. F. Wolfram. The June rate is to be continued if Olds gets materials.

Hardtop demand at other GM divisions is also good and may have bearing on the apparent decision to reduce offerings with the so-called "fast-back." Behind these moves undoubtedly is the desire to weed out the number of body styles so that materials can be channeled into the models with broadest consumer appeal. Less body-die outlay for 1952 model changes may also be an important factor.

K-F Delivers on Aircraft Part

First shipment of center section flaps for the Navy's Lockheed P2V Neptune patrol bomber has been made from Kaiser-Fraser's Aircraft Division at Oakland, Calif., less than a month after production started. Although now occupying only 50,000 sq ft at the plant, aircraft manufacturing after June will be centered in a building of twice that size which is undergoing construction. This facility will be tooled for manufacture of fuselage waist sections for antisubmarine craft.

Chrysler Pins Hopes on V-8

White hope of Chrysler Corp. is its 180-HP V-8 engine. Placed only in the most luxurious cars in Chrysler Division's lineup, the engine has exceeded all the company's expectations in customer reaction. "We sincerely can say that never before have we known such owner enthusiasm" is the comment made by Joseph A. O'Malley, general sales manager.

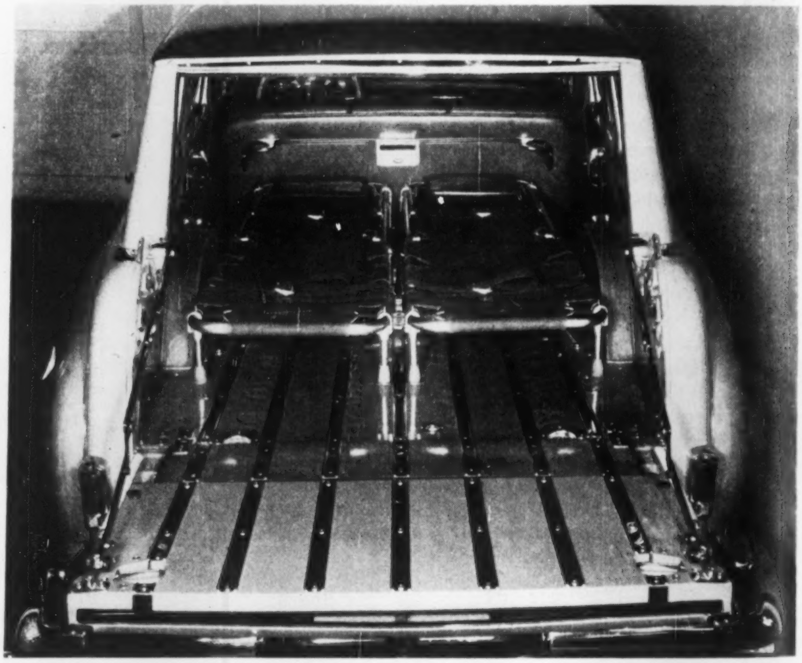
Present schedules call for output of about 400 V-8 cars a working day in May, 500 a day in June and 600 a day thereafter. "Even with production of 600 per day," he asserts, "we cannot expect to catch up to demand if it continues at the present level. Furthermore, we anticipate a very definite increase in demand as more and more of these V-8 cars get in the field."

How significant these figures are is illustrated by two additional statements by Mr. O'Malley: first, that the engine line is already committed to approximately 12,000 more eight-cylinder units than were shipped in the entire 1950 year, the existing record; and second, that by June monthly output of eights will equal first quarter's shipments.

Ford Aids Education

Preoccupation with education seems to characterize two off-shoots of the Ford Motor Co. Henry Ford II, president of the Ford Motor Co. Fund recently announced it will award approximately 70 four-year scholarships to children of Ford employees and will also contribute $500 a year to privately endowed colleges or universities which these scholars elect to attend. This fund is a non-profit corporation entirely independent of the Ford Foundation.

The foundation has taken two other steps toward "meeting its obligations in the field of formal education." It has established a fund for the advancement of education with an interim budget of $7,154,000, and it has set up a fund for adult education with a budget of $3 million. The first of these non-profit organizations will devote its attention to educational problems at primary, secondary, college, and university levels, authorizing basic studies on educational goals and procedures and encouraging experimentation for which no machinery or funds have been available, says Paul G. Hoffman, president.



RIDING IN STYLE: Utility and versatility for civilian defense needs are design features of Chrysler's new ambulance. Mounted on a Royal chassis, the vehicle is normally used as a four-door administrative car seating six passengers. In emergency it can be converted into a two-stretcher ambulance

The Business Trend

Some signs of business declines appear but government says they won't reverse basic upward trend in activity. Production index meanwhile is steady and strong

INDUSTRIAL PRODUCTION as a whole is steady and strong now, but what'll it be a few weeks or a few months from now? That's a question of increasing importance in the minds of businessmen. Defense business, they know, is supposed to be felt increasingly in industry. But before it gets into full swing, how strong will demand be for civilian goods? And after defense business gets into full swing how much civilian business will there be?

Good questions! If you're trying to answer them perhaps you'll be interested in these straws in the wind: Two television set producers cut output and laid off employees because of lagging demand. Dun & Bradstreet reports interest in television sets, appliances and furniture continues to decline more than is usual for this time of year. Valuation of building permits in 215 cities in March was 3.8 per cent below that for March of last year. A survey sponsored by the Federal Reserve Board indicates there may be somewhat less urgency in consumer buying in the automobile and major appliance markets this year.

Noting these changes of pace, the U. S. Office of Business Economics declares they do not reflect a shift in the basic trend. The fundamental driving force, the government defense program, is still in the initial stage of expenditures and use of scarce resources, that office points out.

Pulse Is Steady . . .

Currently, the civilian and defense demands are sufficient to sustain STEEL's industrial production index at approximately the level to which it was lowered at the beginning of April when government restrictions on the end-use of steel became effective. For the week ended Apr. 21 the index is 219 per cent of the 1936-1939 average. In the first week of April it was 216; in the second week, 218. Highest point ever reached was 225, in the week ended Feb. 24. In the week ended Apr. 22, 1950, the index was 197.

Steel Output Near Record . . .

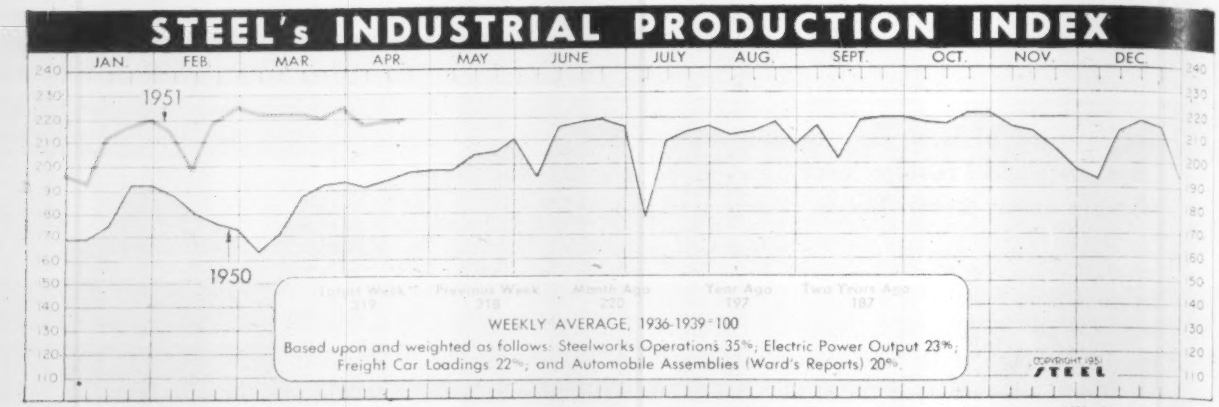
One of the major sustaining forces in the current high rate of industrial activity is steel production. In the week ended Apr. 28, output of steel for ingots and castings was scheduled to edge up to 2,065,000 net tons, only 4000 tons under the alltime high of a month ago, the American Iron & Steel Institute reported. This marks the eighth successive week of operations above theoretical capacity. In the week ended Apr. 21, production totaled 2,057,000 tons.

Auto Production Gains . . .

Automobile production, cut back Apr. 1 by government restrictions on the end-use of steel, has been holding since then at around 160,000 passengers cars and trucks a week in the United States and Canada. Varying slightly upward in the week ended Apr. 21, output totaled 165,477 cars and trucks, compared with 162,839 in the preceding week, says *Ward's Automotive Reports*. One year ago

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	103.0	102.5	100.5	100.0
	Electric Power Distributed (million kilowatt hours)	6,730	6,747	6,848	5,846
	Bituminous Coal Production (daily av.—1000 tons)	1,662	1,518	1,653	1,931
	Petroleum Production (daily av.—1000 bbl)	6,144	6,120	6,037	5,026
	Construction Volume (ENR—Unit $1,000,000)	$220.8	$311.2	$159.8	$236.7
	Automobile and Truck Output (Ward's—number units)	165,477	162,839	174,674	151,613
	*Dates on request. †Weekly capacities, net tons: 1951, 1,999,035; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,721.				
TRADE	Freight Car Loadings (unit—1000 cars)	760†	778	749	723
	Business Failures (Dun & Bradstreet, number)	151	172	170	188
	Currency in circulation (in millions of dollars)‡	$27,157	$27,166	$27,121	$26,992
	Department Store Sales (changes from like wk. a yr. ago)‡	+13%	−9%	+11%	−19%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$16,652	$15,593	$20,236	$15,094
	Federal Gross Debt (billions)	$254.7	$254.8	$254.8	$255.6
	Bond Volume, NYSE (millions)	$16.0	$23.6	$11.6	$18.7
	Stocks Sales, NYSE (thousands of shares)	7,820	8,420	5,645	15,331
	Loans and Investments (billions)†	$69.7	$70.1	$69.5	$66.6
	United States Gov't. Obligations Held (millions)†	$30,713	$30,674	$30,782	$35,941
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	171.92	171.92	171.92	156.13
	STEEL's Nonferrous Metal Price Index‡	243.4	246.2	239.2	162.3
	All Commodities†	183.2	183.0	183.9	152.5
	Metals and Metal Products†	189.6	189.9	189.3	168.8
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				


STEEL's INDUSTRIAL PRODUCTION INDEX

*Week ended Apr. 2

output totaled only 151,613 passenger cars and trucks.

Construction Slackens . . .

Awards of contracts for heavy construction dropped in the week ended Apr. 19 to a level 25 per cent below the average week to date this year, but by normal standards they could not be considered low, *Engineering News-Record* reports. Awards that week totaled $220,797,000.

Industrial buildings, which in most recent weeks have been the biggest factor in the awards, were in second place in the week ended Apr. 19. In first place that week were public buildings, amounting to $51.7 million.

Heavy construction contracts awarded in the first 16 weeks of 1951 had a total value of $4713 million, a 45 per cent gain over the corresponding period of last year.

Coal Output Up Slightly . . .

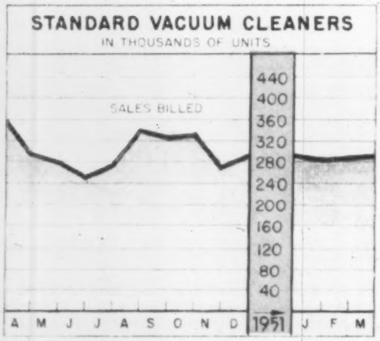
Output of bituminous coal is running somewhat lower than it did earlier in the year. Contrasted to production of around 11 million tons a week in January and part of February, output in the week ended Apr. 14 was estimated at 9,975,000 net tons. In the preceding week it was 9,110,000 tons.

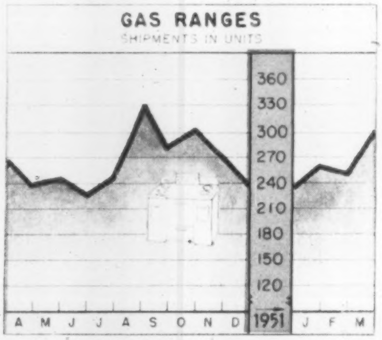
Current output of bituminous coal is considerably below the level of this time last year. Then it was better than 11 million tons.

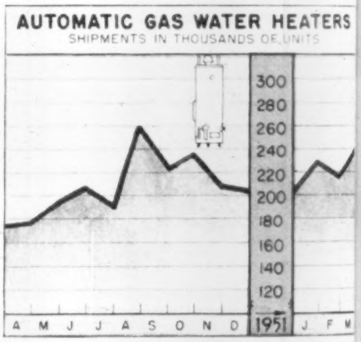
Production for this year is still running ahead of that for 1950. Through Apr. 14, 1951, output totaled 154,145,000 tons; in the corresponding period of last year when a miners' strike occurred the production was 120,794,000 tons.

Price Index Turns Upward . . .

After two consecutive weeks of decline, the government's wholesale price index rose fractionally in the week ended Apr. 17. This put the


STANDARD VACUUM CLEANERS
IN THOUSANDS OF UNITS


GAS RANGES
SHIPMENTS IN UNITS


AUTOMATIC GAS WATER HEATERS
SHIPMENTS IN THOUSANDS OF UNITS

Standard Vacuum Cleaners

Sales Billed—Units

	1951	1950	1949
Jan.	282,305	249,150	228,769
Feb.	287,177	263,515	241,267
Mar.	290,242	361,014	309,897
Apr.		292,664	252,656
May		278,645	222,850
June		250,190	207,354
July		279,967	161,920
Aug.		341,232	219,909
Sept.		327,524	250,036
Oct.		331,445	272,520
Nov.		265,310	253,516
Dec.		288,756	265,513
Total		3,529,412	2,886,514

Vacuum Cleaner Mfrs. Assn.

Gas Ranges

Shipments in Units

	1951	1950	1949
Jan.	260,600	165,000	106,700
Feb.	249,700	209,000	117,700
Mar.	303,000	264,000	151,500
Apr.	......	239,100	150,100
May	......	242,800	151,600
June	......	217,000	162,200
July	......	254,800	125,800
Aug.	......	331,500	206,100
Sept.	......	287,000	227,300
Oct.	......	308,000	257,500
Nov.	......	269,100	237,400
Dec.	......	235,900	175,700
Total	......	3,023,200	2,069,600

Gas Appliance Mfrs. Assoc.

Automatic Gas Water Heaters

Shipments in Units

	1951	1950	1949
Jan.	225,600	131,600	88,400
Feb.	215,000	156,500	84,500
Mar.	240,000	172,800	106,000
Apr.	......	176,400	115,200
May	......	195,200	120,200
June	......	207,100	132,200
July	......	197,500	114,400
Aug.	......	259,800	138,800
Sept.	......	222,600	147,300
Oct.	......	235,100	154,200
Nov.	......	206,000	138,300
Dec.	......	202,500	126,500
Total	......	2,363,100	1,466,000

Gas Appliance Mfrs. Assoc.

Charts—Copyright 1951, S

index up to 183.2 per cent of the 1926 average. Index for the week ended Apr. 10 was 183. Postwar peak was 183.9)

Tool Orders Decline . . .

New orders for machine tools eased off moderately in March, while shipments increased. New orders were equal to 591.8 per cent of the average shipments in 1945-1947, the National Machine Tool Builders' Association reports. In February, new orders had soared to 615.5 per cent.

Shipments in March rose to 158.8 per cent of average shipments in 1945-1947. Level of February shipments was 123.8 per cent.

Steady Work-Weeks . . .

The factory work-week continued at mid-March at about the same high level that has been maintained for the last eight months, the U. S. Department of Labor reports. It was 41.1 hours.

In machinery plants the average work-week not only was higher than the average for all factories but was the highest among manufacturing industries.

More Businesses Fail . . .

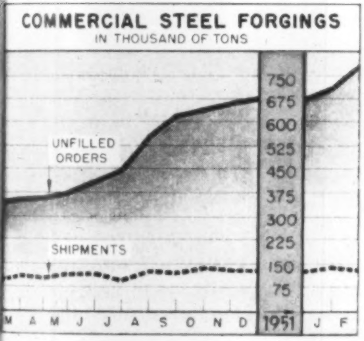
Business failures in March jumped 22 per cent over the number recorded in February. Failures in March totaled 732, compared with 599 in February, Dun & Bradstreet reports.

Trends Fore and Aft . . .

New orders received by Westinghouse Electric Corp., Pittsburgh, in the first quarter of 1951 were the highest in the company's history and twice as great as in the first quarter of 1950 . . . Of $98,250,000 worth of unfilled orders held at the end of March by Blaw-Knox Co., Pittsburgh, 40 per cent were ordnance, engineering and construction contracts for the government . . . An alltime high in the amount of new locomotive power on order by Class 1 railroads was established Apr. 1. On order then were 1883 locomotives comprising 2420 power units.

Issue Dates of Other FACTS and FIGURES Published by STEEL:

Durable Goods	Apr.2	Gear Sales	Apr.16	Purchasing Power	Apr.23
Employ., Metalwkg	Apr.2	Gray Iron Castings	Mar.5	Radio, TV	Apr.23
Employ., Steel	Apr.9	Indus. Production	Apr.16	Ranges, Elec.	Apr.9
Fab. Struc. Steel	Apr.16	Ironers	Mar.26	Refrigerators	Apr.9
Foundry Equip.	Apr.23	Machine Tools	Apr.2	Steel Castings	Feb.26
Freight Cars	Apr.23	Malleable Cast.	Mar.12	Steel Shipments	Apr.23
Furnaces, Indus.	Apr.16	Price Indexes	Apr.2	Wages, Metalwkg.	Apr.16
Furnaces, W. Air	Apr.9	Pumps, New Orders	Apr.9	Washers	Mar.26

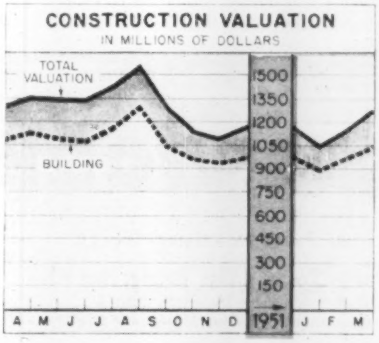


Commercial Steel Forgings

Thousands of Net Tons

	Shipments 1951	Shipments 1950	Unfilled Orders 1951	Unfilled Orders 1950
Jan.	138	93	709	327
Feb.	129	93	781	341
Mar.	...	109	...	350
Apr.	...	99	...	357
May	...	114	...	373
June	...	117	...	408
July	...	95	...	446
Aug.	...	124	...	548
Sept.	...	122	...	620
Oct.	...	137	...	643
Nov.	...	130	...	657
Dec.	...	128	...	674

U. S. Bureau of the Census.

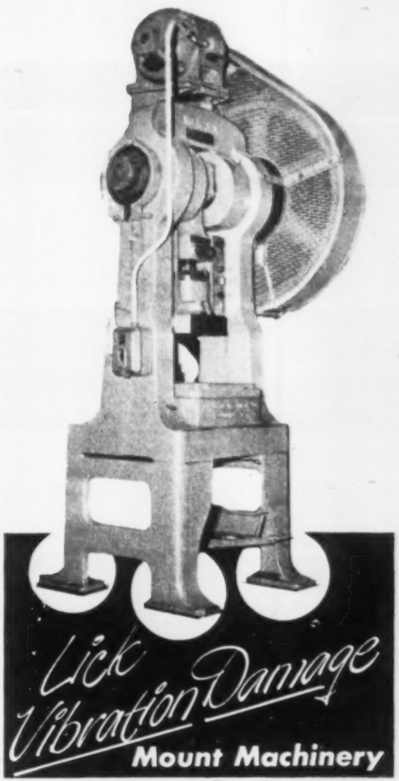


Construction Valuation

(37 States)—In Millions of Dollars

	Total 1951	Total 1950	Building 1951	Building 1950
Jan.	1,043.2	730.9	881.9	578.8
Feb.	1,140.5	779.5	962.3	627.0
Mar.	1,267.4	1,300.2	1,043.8	1,075.3
Apr.	......	1,350.5	....	1,123.5
May	......	1,347.6	....	1,083.0
June	......	1,345.5	....	1,072.0
July	......	1,420.2	....	1,162.2
Aug.	......	1,548.9	....	1,295.1
Sept.	......	1,286.5	....	1,048.3
Oct.	......	1,135.8	....	956.7
Nov.	......	1,087.1	....	931.6
Dec.	......	1,168.4	....	969.0
Total	......	14,501.1	....	11,922.5

F. W. Dodge Corp.



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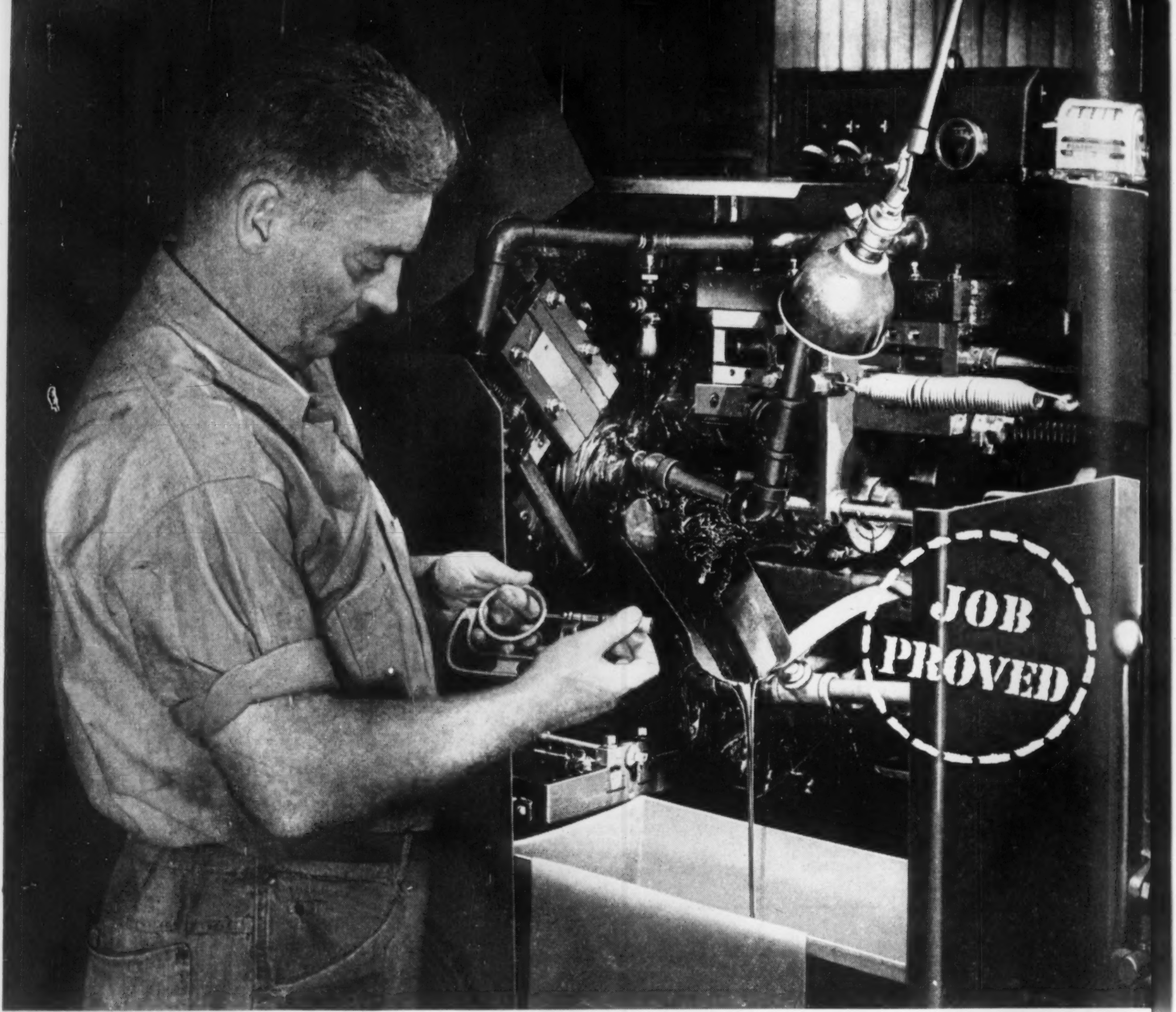
Mills: Johnson City, N. Y. Millbury, Mass. Jackson, Mich. New York, N. Y.



ONE OIL DOES WORK OF TWO

Dual-Purpose Sunicut Replaces Two Former Oils; Dilution Ends; Finishes Improve; Tool Life Lengthens

When one oil does work formerly requiring two . . . and with marked superiority . . . it doesn't make good sense to keep on buying two.

That is precisely why a prominent ball bearing manufacturer changed to Sunicut. He had been using one oil for lubricating his automatics, and another for cutting, but without complete satisfaction. The lube oil kept diluting the cutting oil by leaking into it. As a result, he got poor finishes and tool life was short. A Sun representative, called in to study the situation, advised using a dual-purpose grade of Sunicut. Adoption of his recommendation solved the problem.

For three years now, Sunicut has been used by the entire automatic department with complete satisfaction. A year ago a switch was made to the *new* Sunicut with Petrofac, Sun's revolutionary all petroleum additive, and even better performance has resulted.

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Men of Industry

GEORGE T. FONDA
. . . V. P. at Weirton Steel

STANLEY F. KRZESZEWSKI
. . . American Wheelabrator V. P.

ROBERT FULTON
. . . plant mgr. at Nat'l Radiator

George T. Fonda was appointed vice president of **Weirton Steel Co.,** Weirton, W. Va., responsible for all activities classified as industrial relations. He has been with Weirton for the last 18 years as assistant to the president. Five men named to head up the various phases of work in the industrial relations department, recently reorganized into five separate divisions, are: **Ray M. Corll,** director of employee relations; **C. B. Dodd,** director of insurance, pensions and safety; **E. M. Mentzer,** director of employment services; **John A. Jones,** director of publications and publicity; and **Dr. J. L. Thompson,** director of medical services.

William J. Woods was named director of purchasing for **Mackintosh-Hemphill Co.,** Pittsburgh. He succeeds **R. G. Schell** who has assumed other responsibilities with the company. For the last seven years Mr. Woods has been purchasing agent, rolling mill division, E. W. Bliss Co., Salem, O.

D. T. Turnbull was elected treasurer, and **J. M. Goodson,** auditor of **Woodward Iron Co.,** Birmingham. Mr. Turnbull was assistant treasurer, and Mr. Goodson was head of the accounting department.

Cleveland Automatic Machine Co., Cincinnati, increased the number of its directors from seven to nine. **A. F. Jelinek,** chief engineer, and **J. C. Maezer,** factory manager, were elected to the two additional places. Mr. Jelinek has been with the company for 33 years, and was promoted to chief engineer in 1944. Mr. Maezer joined the company in 1929 and became factory manager in 1945.

Stanley F. Krzeszewski was elected a vice president of **American Wheelabrator & Equipment Corp.,** Mishawaka, Ind. He continues as factory manager, a position he has held for the last five and a half years.

Orson A. Rockwell was elected a vice president of **Calumet & Hecla Consolidated Copper Co.,** Boston. He is general manager, Calumet Division, which includes the company's copper mines, smelting and chemical plants in Michigan, and its zinc-lead mine at Shullsburg, Wis.

I. W. Wilson was elected president, **Aluminum Co. of America,** Pittsburgh, succeeding **Roy A. Hunt,** president since 1928, who was named chairman of the executive committee. **Arthur V. Davis** continues as chairman of the board. **Leon E. Hickman** was elected vice president and general counsel.

I. W. WILSON
. . . new president at Alcoa

Robert Fulton was appointed plant manager, plastic metals division, **National Radiator Co.,** Johnstown, Pa. He has been plant superintendent since 1949, and is now responsible for manufacture of many types of metal powders used in powder metallurgy, electronics and chemistry. Before joining National Radiator, Mr. Fulton was production manager of the Chauncey, N. Y., plant of Indiana Steel Products Co.

A. O. Smith Corp., Milwaukee, elected **Lloyd B. Smith** president. **William C. Heath** moves from president to chief executive officer, a new position. Mr. Smith, great-grandson of the founder of the company, was a vice president. **Anthony von Wening,** vice president, was named chairman of a newly created finance committee.

Edward K. Foster was elected a vice president and member of the administration committee of **Bendix Aviation Corp.,** Detroit. He continues as general manager, radio communications division, Baltimore.

B. V. Ronco was appointed chief engineer, **Morrison Steel Products Inc.,** Buffalo. He formerly was chief inspector for Mack Trucks Inc.

Effective May 1, promotions at **Pittsburgh Consolidation Coal Co.,** Pittsburgh, include: **G. A. Shoemaker,** president, Pittsburgh Coal Co., a division, was elected a vice president of the parent company. **Henry C. Rose,** vice president of the division, was elected president, succeeding Mr. Shoemaker. **Walter F. Schulten,** assistant to **J. B. Morrow,** who retired Apr. 9 as first vice president, was elected a vice president. **J. M. Knowles,** co-ordinator of purchases, was elected a vice president.

Sander G. Lawrence was elected vice president and a director of **Lerch Bros. Inc.,** iron ore chemist, Hibbing, Minn. **Leo J. Storms** was elected treasurer, assistant secretary and a director.

Jacob W. Vreeland was appointed chief metallurgist for the electroplating anode division of **Wagner Bros. Inc.,** Detroit.

Edward Barwell was named industrial relations co-ordinator of **Worthington Pump & Machinery Corp.,** Harrison, N. J. He has been with Crocker-Wheeler Electric Mfg. Co. since 1926.

Organizational changes in the small motor division of **Westinghouse Electric Corp.** at Lima, O., include: **H. E. Grout,** named works manager; **W. P. Bell,** manager of manufacturing; and **C. F. Herbold,** superintendent of quality control. At the corporation's lighting division in Cleveland, **W. R. Davies** was appointed manager, specialties section.

Robert F. Lamb was appointed sales and service engineer in western New York for **Esterline-Angus Co. Inc.,** Indianapolis.

Walter G. McBurney was appointed works manager of the Niagara Falls, Ont., plant of **North American Cyanamid Ltd.**

Firth Sterling Steel & Carbide Corp., McKeesport, Pa., appointed: **W. P. Nolan** chief engineer, **T. G. Barnes** production manager, **J. T. O'Brien** works manager of the steel division, and **T. F. Nakles** superintendent of maintenance.

FLOYD W. CROUCH
. . . National Works chief metallurgist

Floyd W. Crouch was appointed chief metallurgist and **Jaye S. Gamble,** assistant chief metallurgist at National Works, U. S. Steel's **National Tube Co.,** Pittsburgh. **William B. Kennedy** was appointed division superintendent in charge of blast furnaces, openhearth furnaces, bessemer converters and rolling mills; and **Arthur W. Thornton** was appointed division superintendent, pipe production, finishing and shipping.

W. R. Eby was named manager, Pacific district, **York Corp.,** York, Pa. He succeeds **Rodney F. Lauer,** recently made vice president in charge of engineering and research. **Thomas A. Marshall** succeeds Mr. Eby as industrial sales manager of the Pacific district.

Joseph H. Reid, manager of **National Lead Co.'s** titanium division, New York, was elected a vice president of the company. He joined National Lead in 1927 with the St. Louis Smelting & Refining Division as a mining engineer, and transferred in 1936 to the Baroid Sales Division where he became production manager. Mr. Reid went to the general office in New York in 1941. He was appointed manager of the titanium division in 1949.

Wean Equipment Corp., Cleveland, appointed the following as district engineers: **W. H. Millan,** formerly project engineer in its engineering department; **W. E. Heineman,** formerly production manager of Wean Equipment; **R. P. Popp,** formerly assistant purchasing agent; and **I. W. Spraitzar,** formerly with Wean Engineering Co. Inc., Warren, O.

Dow Chemical Co., Midland, Mich., named **R. E. McNulty** as manager of its new Madison, Ill., division. He formerly was production manager for magnesium wrought products at Midland, and that position is assumed by **D. W. Watters,** who also becomes production manager at Madison. **R. L. Dietrich** succeeds Mr. Watters as superintendent of the rolling mill. **G. Ansel** was named chief metallurgist at Madison. Others appointed to the Madison division include: **Henry Burke** as chief engineer; **W. H. Jones** as supervisor of administrative and service departments, **E. E. Van Stee** as purchasing agent, **H. H. Lyon** as resident accountant, and **F. C. Mansfield** as personnel manager.

Louis C. Begg was appointed district manager of the newly established Buffalo sales division of **Ampco Metal Inc.,** Milwaukee. He transfers from the Ampco main office in Milwaukee where, for the last three years, he has been special sales engineer for Ampco centrifugal pumps and all Ampco alloys and products.

National Roll & Foundry Co., Avonmore, Pa., promoted **E. C. Girty** to vice president in charge of opera-

W. P. NOLAN
chief engineer of Firth Sterling

JOSEPH H. REID
. . . V. P. of National Lead

E. C. GIRTY
. . . National Roll & Foundry V. P.

PAUL REEVES

Elected director of sales, Timken Roller Bearing Co., Canton, O. Noted in STEEL, Apr. 16 issue, p. 65

ROBERT T. FRISBIE

Elected president, New Britain Machine Co., New Britain, Conn. Noted in STEEL, Apr. 16 issue, p. 65

RALPH S. HOWE

Exec. vice president, New Britain Machine Co., New Britain, Conn. Noted in STEEL, Apr. 16 issue, p. 65

tions. Since 1949 he has been general superintendent of National's plant at Avonmore, and previously was with Pittsburgh Rolls Division, Blaw-Knox Co., in the capacity of research metallurgist, production development engineer and superintendent. **W. E. Curran,** with National since 1942, was promoted to general superintendent, and **J. C. Kepfer** was named executive assistant. **Reynold E. Klages,** Columbus, O., was elected chairman of the board, and **Leland E. Smith,** Allentown, Pa., was elected vice president.

Arnold Helgeson was appointed to direct activities of the foundry division of **Rosan Inc.,** South Gate, Calif.

Columbia Steel Co., U. S. Steel subsidiary, appointed **Carl S. Warner** superintendent of maintenance utilities at its Torrance, Calif., plant. **William Montgomery** was named his assistant. **Jackson S. Moore** is assistant superintendent, and **Gar Johnson,** general foreman, rolling mill department.

Allison L. Bayles was appointed vice president of engineering, **Scaife Co.,** Oakmont, Pa. **Allen M. Harrelson** was appointed controller. Mr. Bayles formerly was with C. H. Wheeler Mfg. Co. and American Engineering Co.

Karl A. Roesch was appointed general manager, motor coach division, **White Motor Co.,** Cleveland. He was assistant to the vice president in charge of sales. **Earl H. Lewis** was named assistant wholesale manager and assistant to the vice president-sales.

Delta-Star Electric Co., Chicago, division of H. K. Porter Co. Inc., appointed **John Romano** general sales manager, and **M. T. Schmid** comptroller. **R. S. Keeler** was named manager of utilities sales and **W. H. Boyce,** manager of the industrial division.

C. A. Carter was added to the Seattle office of **Signode Steel Strapping Co.,** Chicago. He will cover Washington, northern Idaho and Montana.

Automatic Steel Products Inc., Canton, O., elected **Ralph H. Everett** a director for a three-year term.

Herbert F. Gunnison was appointed sales representative in the Louisville area by **Signode Steel Strapping Co.,** Chicago. His territory includes Louisville, most of Kentucky and a part of southern Indiana.

Roy H. Nelson, assistant superintendent of Brier Hill blast furnaces for ten months, was transferred to Hubbard, O., as assistant superintendent of the Hubbard Furnace of **Youngstown Sheet & Tube Co.**

Donald MacArthur was appointed assistant manager, sales department, central staff, **Koppers Co. Inc.,** Pittsburgh. **T. H. Cable** was made manager of the international product sales section of the department.

E. R. Almdale was appointed manager of the Michigan district for **Carboloy Co. Inc.,** Detroit. He assumes the position vacated by **P. J. Jenson,** called back to duty in the Detroit Ordnance District.

John H. Helenhouse, formerly assistant works auditor, United States Steel Co. at Gary, Ind., was appointed assistant controller of staff activities of **Ford Motor Co.'s** steel division, Dearborn, Mich. **E. A. Forsyth** continues as assistant controller of steel operations.

OBITUARIES . . .

T. R. Hudson, 65, engineer in charge of plants of **United States Hoffman Machinery Corp.,** Syracuse, N. Y., died Apr. 20. He had been with the firm for 34 years.

Harry W. Griffin, 75, president, **Taylor-Stiles & Co.,** Riegelsville, N. J., cutting machine manufacturer, died Apr. 22.

Arnold L. Colebrook, 65, treasurer and a director of **Empire Plow Co.,** Cleveland, died Apr. 23.

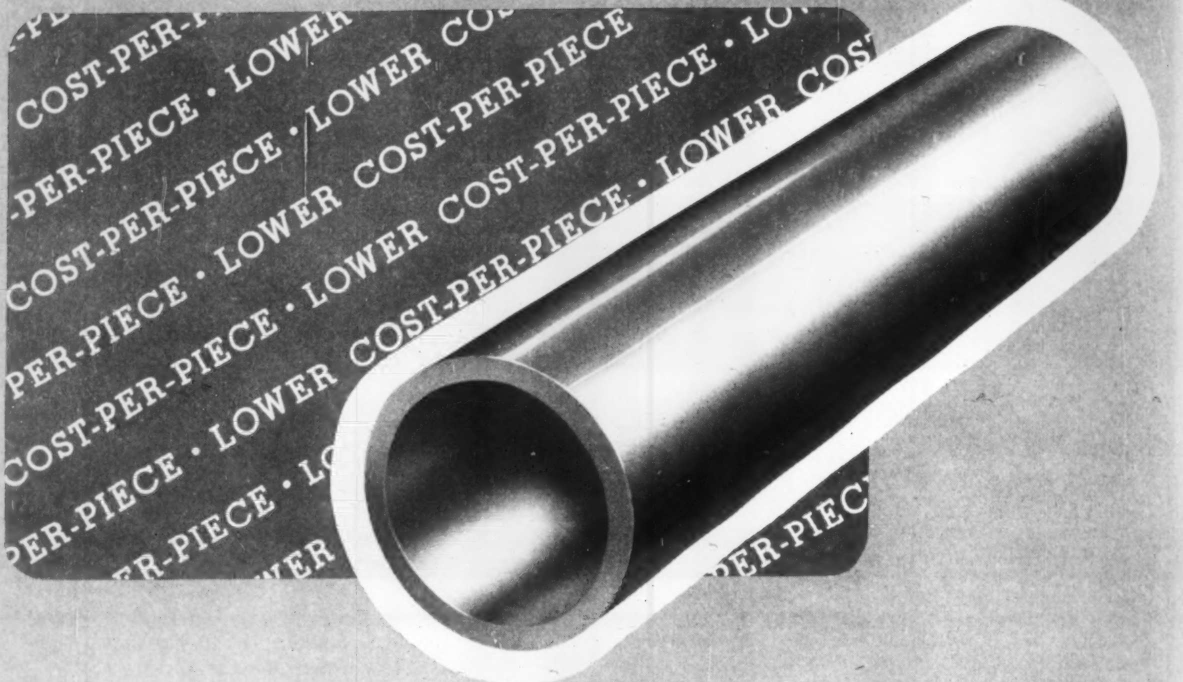
William V. Young, 33, sales manager for **Kirby Co.,** Buffalo, died of a heart attack Apr. 21. He formerly was assistant production manager for Curtiss-Wright Corp. in Buffalo.

Henry W. Pleister, 74, chairman of the board of **Diamond Expansion Bolt Co.,** Garwood, N. J. died Apr. 18.

Theodore L. Burkhardt, 51, member of the New York sales department, **Bethlehem Steel Co.,** died Apr. 16.

Taylor Jelliffe, 68, president, **Wisconsin Metal Products Co.,** Racine, Wis., died Apr. 17 after a long illness.

Edwin B. Jackson, 74, a pioneer in the automotive sales field, and for the last ten years president of **Lock Thread Corp.,** Detroit, died Apr. 15 at St. Simons Island, Ga., after an illness of a few days.



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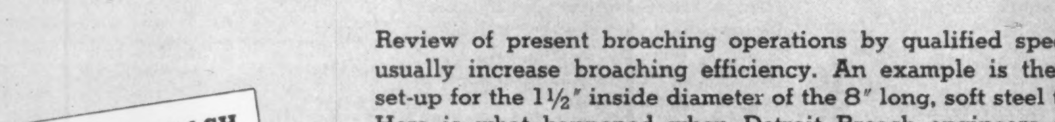

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Production AND Engineering
NEWS AT A GLANCE

OPEN-HEARTH BAZOOKA— Latest of the few examples of military equipment being adapted to civilian industry is the "jet tapper" for open hearths which DuPont is now supplying. It resembles the armor-piercing bazooka, comprising a 2-ounce shaped explosive charge enclosed in a plastic case surrounded by a hollow bullet-shaped insulating body. Key to the penetrating power is a thin copper cone imbedded in one end of the charge. Not definitely in the commercial stage, jet tappers are proving effective means for obtaining full initial flow from open-hearth tapholes, as well as for lessening taphole maintenance and reducing ladle skulls. —p. 64

COAL VEIN CRACKER— Paralleling the jet tapper is another DuPont device called Chemechol, a nonexplosive gadget for breaking coal from a mine face by the force of compressed gas generated by chemical reaction within the device and released mechanically. It produces no flame, cannot be activated by small electrical currents or by the high currents of haulage and lighting circuits, and is not detonated by blasting caps or dynamite. Chemecol is now in the transition stage from laboratory to field testing. So far, it looks pretty good, and the company regards it as the most important development for breaking down coal since the introduction of permissible explosives early in the century.

STEAM ON STAINLESS— Embrittling effect of steam on hardenable grades of stainless steel is demonstrated clearly in metallurgical studies made for the Office of Naval Research, principally by means of special bend tests on exposed specimens. Aging treatments in hot glycerine produced complete recovery over varying periods of time. —p. 54

POWDER VS. ARC-CAST MOLY— With the knowledge that molybdenum can be wrought and annealed so as to have high ductility when fully recrystallized, two Westinghouse research metallurgists made an effort to compare in this preferred condition one lot of molybdenum as consolidated by powder metallurgy methods with another lot consolidated from powder by arc casting. Results showed little difference either in tensile properties determined over a range of temperatures above and below atmospheric or in creep strength at 1600° F. They did note a well-defined transition between ductile and brittle on tensile test at a temperature only slightly below atmospheric, similar to that occurring in iron at lower temperatures. The fine-grained fully recrystallized condition in pure molybdenum is unfavorable to creep strength as it is known to be in other pure metals, but its creep strength is remarkably high relative to other pure metals of lower melting point and even to alloys of the same.

IRON POWDER FOR SHELL BANDS—A subcommittee on powder metallurgy of Army Ordnance Association's shell committee has been busy since last August, under chairmanship of A. J. Langhammer, head of Chrysler's Amplex Division, looking principally into facilities and techniques for supplying powdered iron rotating bands for various sizes of shells. Brief report was given at the Metal Powder Association meeting in Cleveland last week. On the question of iron powder availability, the committee stated positively that if facilities contemplated by present producers and by others who plan to enter the field are fulfilled "no shortage for present requirements is expected." Further it was indicated the shift from nonferrous to iron powder driving bands may call for minor changes in the banding and machining process, but "no apprehension" is felt over such problems. Sample bands produced from ten varieties of powder have been submitted to Ordnance for firing tests.

CONTINUOUS STRIP ANNEALING— Bright annealing of cold-rolled strip steel up to 34 inches wide at speeds up to 300 fpm for 0.010-inch thickness is an interesting example of the application of continuous methods to a process which is generally carried out by the batch system, in which coils are placed under separate hoods and heated for periods up to 100 hours. —p. 68

MECHANIZING CHAIN HANDLING— Turning out 300 different kinds of chain at a rate of one carload of wire a day calls for concentrated attention to handling methods, including raw material storage and the movement of semifinished chain between production departments. Horizontal stacking of wire coils in a woven pattern, with the aid of a specially-designed machine, was one space-saver. —p. 59

EVAPORATING DOLLARS— Losing too much solvent in your vapor degreasing operations? Better check these: Diffusion from mixing solvent vapor with air or with water; dragout of liquid solvent from the tank; leakage or spillage; loss of solvent in discarded degreaser sludges; or possibly improper use of the solvent. On the latter score, for example, trichlorethylene is not too well suited to cold cleaning operations. And in some plants there is found indiscriminate use of expensive solvent for cleaning floors, clothing, rags and whatnot. —A.H.A.

Embrittling Effect of S

By CARL A. ZAPPFE
and F. E. LANDGRAF
Metallurgists, Baltimore

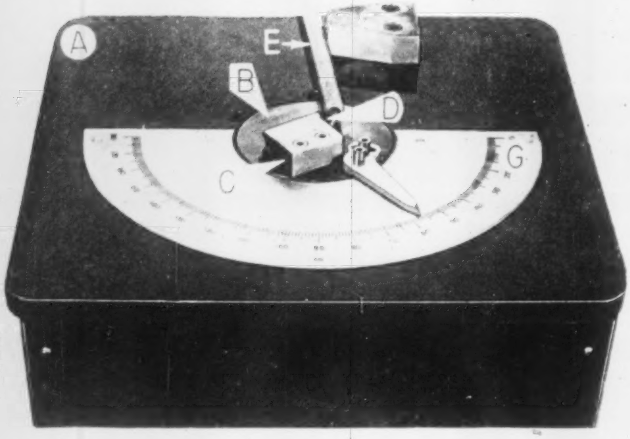


Fig. 1—Specially designed bend test for studying gas-metal reactions. (A) ¾-inch steel plate facing, (B) rotating shaft driven by ¾-hp motor, (C) replaceable die, designed for ¼-inch round rod and a bending radius of same size as rod, (D) specimen inserted in die and in process of bending around radius, visible as rounded projection on die, (E) sleeve fitting on free end of specimen and pressing against electric clutch (F)

THREE years ago a paper[1] was published by one of the present authors detailing the thermodynamic theory for a number of steam-metal reactions, and specifically from the standpoint of the chemical activity or fugacity of the hydrogen developed. The principal hypothesis was that any coincident reaction dependent upon the steam-metal reaction, such as solution of the hydrogen in the metal, is primarily related to the surfacial fugacity of nascent hydrogen and not to subsequent removed atmospheric proportions of molecular H_2. A case in point is the occasional reference to the molecular hydrogen content of steam boiler atmospheres[2] when discussing the possibility of hydrogen absorption by the boiler plate. A steam boiler is not a closed system, thermodynamically speaking, and the highly localized chemical reactions at the metal-steam surfaces have only the remotest relationship to the partial pressure of molecular H_2 later found in the macrosystem.

If a steam boiler ever were made a closed thermodynamic system, pressures of molecular H_2 would accumulate which no boiler could withstand without explosion. Since these pressures of H_2 greatly exceeding atmospheric are generated by the localized steam-metal reaction and the nascent or atomic hydrogen it produces, conclusions regarding the ability of steam to inject hydrogen into the metal should be based upon the thermodynamics of the surfacial reactions. These then show that steam in its effectiveness as a hydrogenizer may be equal to perhaps some hundreds or even thousands of atmospheres of pure molecular H_2 depending, of course, upon additional modifying factors.

One of the most important of these is the fact that the steam-metal reaction producing the hydrogen also simultaneously produces an oxide of the metal which in most cases is not removed, but remains to protect the metal from further reaction. This renders the problem primarily a kinetic one for which thermodynamics can only indicate the direction the reaction will take and the limits to which it can go. Experiment then becomes necessary to demonstrate the degree to which such reactions commonly proceed and the importance, if any, with respect to the properties of the metal.

For this, a special bend test was developed[3], consisting essentially of a machine having a rotating shaft turning at the rate of 5 degrees of arc per second, upon which a die is mounted for bending rod or bar around a fixed radius. Fracture of the specimen automatically stops the motor, and the angle of fracture is then read as a measure of the bendability. The face of the machine is shown in Fig. 1. A wide range of sizes and shapes of specimen can be used but the die is here fitted for ¼-inch round stock bent around a ¼-inch pin.

Application of this test to class I (hardenable) grades of stainless steel in the first stage of the research provided "standard" bendability values; and these same steels were then heat treated in atmospheres specially controlled with regard to steam content. The results of this second stage of the work[4] demonstrated so forcefully the importance of the damage done steel by steam that work was continued to provide the results of the ensuing discussion.

Experimental Procedure—In Table I, steels are listed which served as specimens. Whereas it was the purpose of earlier work to make a broad survey of the stainless steels, it was intended here instead to select several typical grades, particularly type 410 analysis which, as type 403, is designed to serve in steam turbines. Type 440-C was chosen because it represents the most hardenable of the stainless steels and also the most susceptible to hydrogen embrittlement. Type 414 was included as a representative of hardenable alloys having a nickel content; and type 430 was introduced from class II as a relatively nonhardening steel to show the great scope of the hydrogenizing problem.

Specimens were cut 4 inches long from ¼-inch round bar stock, washed in alcohol, cleaned with emery paper, and placed as duplicates in an alundum boat in the heat treating furnace. The end later to be inserted in the bending die was marked with a file. Because of slight variations in bendability from heat to heat in a given analysis, and even from bar to bar within one heat, each series of tests was conducted with specimens cut from one bar if possible. Some of the variations in bend data result from tests in which the uniformity could not be maintained, also from other factors not yet controlled, such as in-

# of Steam on Stainless at Elevated Temperatures

Hardened steels which endure a full bend after quenching from a dry atmosphere fail at a relatively low bend angle if steam is admitted to the heat treating furnace. This is specifically true of type 410 or 403, designed for service in steam turbines. Furthermore, the effect is extremely rapid, an exposure to steam for one minute at the close of a heat treatment in dry helium causing virtually as much injury as a complete steam treatment. Causes and cures of this hydrogen sensitivity are examined by the authors who base conclusions on research conducted in the laboratory of the senior author under sponsorship of the Office of Naval Research, Washington

herent hydrogen content of the steel. In general, data within one series are closely comparable, but one series may not always conform closely with another series of the same grade. The bend test is a sensitive test, and its results become more and more uniform as the variables encountered become better recognized.

A horizontal tube (1½-inch ID) furnace, electrically heated, was fitted with sealed ends connected to a gas train and arranged with a thermocouple whose tip was at a point 1 inch from the marked end of the specimen. This permitted close measurement and control of the heat treating temperature at the position on the specimen later to endure the bending.

For steam atmospheres, several means were used to introduce the gas. Water boiled in a flask at the inlet end forced steam through the tube against atmospheric pressure in one case, and in another it was drawn through at slightly less than atmospheric pressure by a vacuum pump. Again, a measured quantity of water was dropped by a pipette into one end of the furnace tube and allowed to evaporate. Once a small boat containing a measured quantity of water was sealed into one end of the tube. No distinctions among these techniques can be made because in all experiments the steam proved to be such a powerful hydrogenizer that the type of control was unimportant so long as steam in such quantities was admitted to the tube.

Elaborate Drying Train—For a contrasting dry atmosphere, a gas train was arranged consisting of drying elements in the following order of flow: (a) Two calcium chloride columns, (b) three spiral Milligan gas-washing bottles containing concentrated H_2SO_4, and (c) four P_2O_5 columns. The reason for this rather elaborate train also follows from the extraordinary hydrogenizing power of H_2O and the great sensitivity of certain of the steels to hydrogen. Either helium or air was passed through this train, and the pressure of the carefully dried gas in the furnace was kept slightly above atmospheric to protect against inleaking.

Hardening and quenching procedures more or less followed mill practice, with exceptions to be noted. Quenching oil was Gulf super-quench 70. Specimens were plunged directly into the oil from the furnace, providing an exposure to room atmosphere of the order of one second. Exceptions in quenching procedure will be noted in discussing special tests.

Dry vs. Moist Atmospheres — In Fig. 2, shaded bands designate in terms of bendability the injury done to several typical grades of stainless steel by steam. The upper boundaries represent averages for specimens hardened from an atmosphere of dried air; the lower for an atmosphere of steam. Hardening time was 15 minutes and the hardening temperatures were as follows:

Type	Temperature, °C
410	985
430	1000
440-C	1040

Previous studies with 410 and 403 showed a full bend of 180 degrees for an air atmosphere, whereas the upper boundary of the shaded area in Fig. 2 shows failure near 110°. This can be attributed to the higher carbon content of the present specimen—0.132 as compared to 0.10—which is listed as heat II of the 410 analysis in Table I. Type 403 bends 180 degrees when quenched from a dry atmosphere, but breaks at 20 degrees of bend if heat treated in steam. The type 410 of Fig. 2 fails at less than 10 degrees of bend when exposed to steam.

Type 430, the minor hardenability of which might be expected to reflect itself in relative nonsusceptibility to hydrogen embrittlement, nevertheless fractures at 50 or 60 degrees when exposed to steam, in contrast to a full bend of 180 degrees sustained by duplicate specimens which have been heat treated in a dry atmosphere.

Pronounced Effect on 440-C—As for type 440-C, this is at once the least ductile of the stainless steels when fully hardened, and the most sensitive to hydrogen. Bendability, already in the low range of 12 to 15 degrees, is reduced to only 5 or 6 degrees when steam is admitted to the heat treating atmospheres. This is a virtually glass-like condition and, in view of the difficulty in handling the grade in the hardened condition anyway, it would seem to be urgent advice that precautions be taken in plant practice to exclude steam from the furnace atmosphere during heat treatment.

In Fig. 3, bendability data are plotted for a duplicate series of hardening treatments—one in dry air and one in steam—for the nickeliferous type 414.

These are typical in showing values which are extremely low, and consistently so, when steam is present. The values for dry air are definitely much higher, but they are often erratic, at least for this grade.

This lack of close agreement for the specimens quenched from dry atmospheres, along with other observations to be discussed later, increased the suspicion that extremely small traces of H_2O could noticeably affect bend values. Experiments were accordingly conducted from which the drying train was developed as described earlier and the amount of moisture present in the furnace was reduced by drying treatments lasting as long as four days previous to running an experiment. Some more or less promising results were obtained; but complexities remain to be resolved in the quantitative study of the effect of moisture, and the present discussion will restrict itself to more or less qualitative aspects. There is also the possible factor of residual hydrogen in the specimens inherited from previous commercial processing.

Fig. 3 clearly displays the extent of damage steam can cause. Whether mechanical properties may be improved importantly by resorting to elaborately dried atmospheres remains to be explored.

Time of Exposure to Steam—The extremely rapid action of steam is indicated by data in Table II. Presence of steam reduces the bendability of type 414 from near 30 degrees to 10 or 12 degrees even when added to the atmosphere only during the final minute of a 15-minute hardening treatment. No additional damage seems to be contributed by further exposure up to the full 15 minutes. As a matter of fact, one might expect that a maximum hydrogenizing occurs in early exposure periods, perhaps modifying toward a point of disappearance as the oxide coating develops its protective effect and slows the hydrogen-generating reaction.

Note will be made here that the production of hydrogen by the steam-metal reaction during heat treatment is sufficiently pronounced, even for these slowly oxidizing steels, to allow combustion of the exiting gas when conditions of flow are appropriate. A commercial process for production of hydrogen, of course, is based upon exactly this reaction of iron and steam; and an effective experimental means for drying an atmosphere—removing the H_2O—involves passing it over a metallic surface.

Temperature of Quench—Because of a possible effect of conditions in the quenching operation itself, two factors were given preliminary evaluation: (1) Temperature of the quenching oil and (2) temperature of the specimen at time of test.

For the first, a series of type 414 specimens was quenched from a dry atmosphere into oils ranging in temperature from −10° to 50° C. Each specimen was transferred to the bend machine and subjected to test within 20±2 seconds of withdrawal from the bath. In some cases the die also was cooled or warmed to the approximate temperature of the quench. The results were inconclusive; but there seemed to be a loss in bendability indicated for oil and testing temperatures below 20°C.

This was substantiated by the second series in which the specimens after quenching in oil at a given temperature were transferred to a second bath at room temperature and were then tested. A loss of some 15 degrees of bend again occurred when the testing was performed at temperatures much lower than 10° or 20°C, but this was then recuperated by

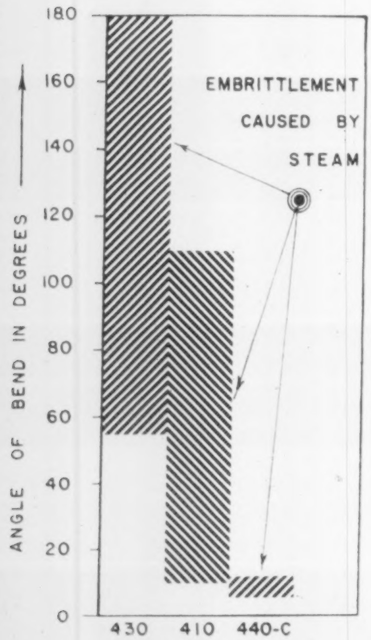
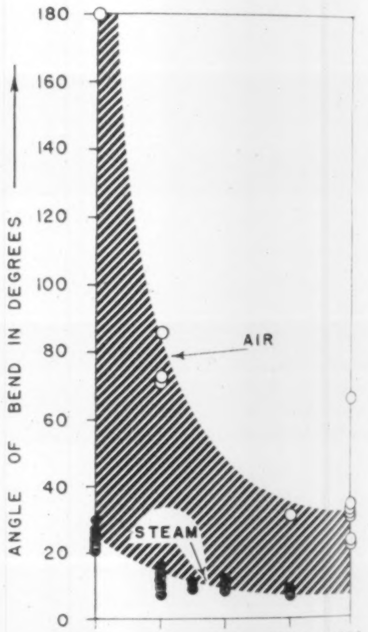


Fig. 2 (left)—Diagram of bendability for several stainless steels in the fully hardened condition, showing extent of damage caused by steam contacting the metal during the hardening heat treatment. Upper boundaries represent average values for quenching from an atmosphere of dry helium; lower boundaries, an atmosphere of steam

Fig. 3 (right)—Bend values for type 414 stainless hardened over a range of temperatures in an atmosphere of dry air (upper boundary of shaded area) and in an atmosphere of steam (lower boundary)



the warming to 20°C before testing. The results, though incomplete, are mentioned because of their suggestion of a possible role both of "slip-transition temperature" and of temperature of the quenching bath so far as some properties of these steels are concerned. The matter is believed to deserve further study.

Nature of Recovery—Specimens of type 410 (heat I in Table I) were damaged by hardening from a steam atmosphere, and their recovery was then studied in subsequent aging treatments. Fig. 4 shows a series hardened to a blank bend value near 20 degrees and aged back to recovery of a full 180-degree bend by 2-hour treatments in glycerine at the indicated temperatures. Very little change occurred in the 2-hour period at temperatures below 100°C, but recovery was complete at temperature above 170°C. In these tests, incidentally, considerable quantities of hydrogen were observed effusing from the steel; and steam-embrittled specimens can be distingiushed readily from dry-treated ones by the formation of bubbles upon being immersed in a hot liquid such as glycerine.

In Fig. 5, the effect of recovery over a period of days at room temperature is shown. It is particularly interesting that this series had a full-hard bendbility of more than 20 degrees shortly after quenching but that one day later the bendability was less than 20 degrees, and that more than a week passed before the values regained the as-quenched blank. A month later an improvement in the steam-damaged condition was definitely noticeable and in two months the samples bent 180 degrees without fracture, as did those quenched from a dry atmosphere.

TABLE I
ANALYSIS OF SPECIMENS

AISI STEEL No.	Composition in per cent Cr	C	Ni
410 (heat I)	12.63	0.102	
410 (heat II)	12.65	0.13	
414	12.32	0.107	1.68
430	16.97	0.072	
440-C	16.88	1.012	

TABLE II
EFFECT OF MOISTURE IN THE HEAT TREATING ATMOSPHERE ON THE BENDABILITY OF HARDENED TYPE 414

Hardening Treatment*	Angle of Bend
15 mins: dry air	22, 23, 30, 31, 33, 34, 36 (Av.=32)
15 mins: Steam**	10, 11, 12
14 mins. in evacuated dry tube at 10^{-3}cm. followed by 1 min. steam	11, 12, 12
Same, but 2 min. of steam	12, 13, 14

* Quenched from 1050° C into oil at R. T.
** Vapor pressure 1 atmosphere.

While the indicated reversal of the aging curve, shown by a black area in Fig. 5, is not too impressive in change of bend angle, the variation seems clearly to be greater than the experimental error expected for those particular tests on the basis of the authors' experience with the bend test to date. Also, such results are particularly understandable because of the "aging minimum" established in other work, both with pickling brittleness[5] and with hydrogen embrittlement from electroplating[6].

Hydrogen does display exactly this behavior, in that an incubation period expresses itself after the hydrogen has been added to the metal, and during which period the embrittlement spontaneously worsens. This can be understood on the basis of the planar-pressure theory[6], which treats embrittlement as a precipitation phenomenon whose registrations from a mechanical standpoint

(*Please turn to Page 81*)

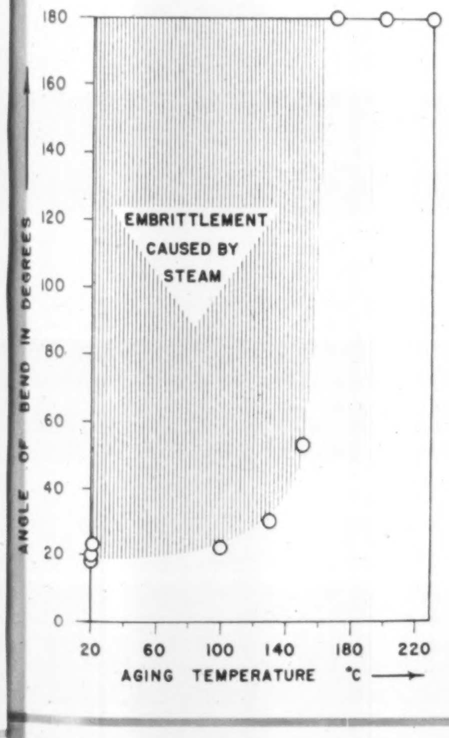
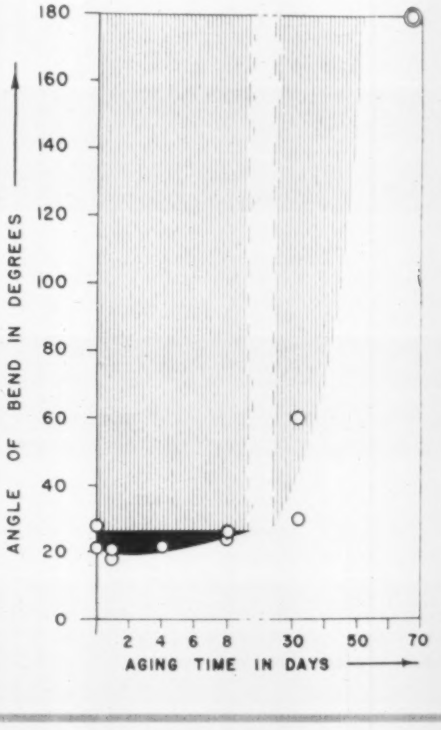


Fig. 4 (left)—Recovery of type 410 embrittled by heat treatment in steam and aged for 2-hour periods in glycerine

Fig. 5 (right)—Recovery of type 410 embrittled by heat treatment in steam and aged at room temperature



Seen and Heard in The Machinery Field

By GUY HUBBARD
Machine Tool Editor

BROWN & SHARPE'S NEW PRESIDENT: On April 10, 1951, a mantle of tremendous responsibility was placed on the shoulders of a young man in Providence, R. I. Fifty-two years before, the same mantle of responsibility had been placed on the shoulders of another young man in Providence.

Henry D. Sharpe, who became president of Brown & Sharpe Mfg. Co. in 1899 at the age of 27—and who on April 10, 1951 became chairman of the board of directors—had three years of practical shop experience before he became president upon the death of his father. His father was Lucian Sharpe who—with Joseph R. Brown—founded the company.

Henry D. Sharpe Jr., who has just become president at the age of 28, is—like his father—an alumnus of Brown University. Following graduation in 1944 he had active service in the Navy, following which he took a two-year Brown & Sharpe training course before undertaking administrative duties. My own contacts with him have been in and around the shop. I know that he knows "what it is all about". He is a worthy successor to an illustrious grandfather and to an equally illustrious father.

Too many men in the American machine tool industry have been forced by circumstances to assume positions of leadership too late in life to successfully cope with changing and always difficult conditions. That has not been true of the Sharpe family. That is a major reason why this great company has weathered economic and technological changes since 1833—and still is going strong.

Originating as a small shop—without mechanical power—devoted to making and repairing clocks, watches and mathematical instruments, this company really began to hit its stride as a manufacturer of measuring tools, cutting tools and machine tools subsequent to 1853, when Lucian Sharpe was taken in as a partner. From that time on, its growth was rapid. Not only does it have an impressive list of firsts—including the universal milling machine and the cylindrical grinder—but also an impressive list of graduates—including the late Henry M. Leland of Cadillac and Lincoln fame, Clayton R. Burt, former president of Pratt & Whitney and Senator Ralph E. Flanders of Vermont.

I am tremendously impressed by two statements made on April 10, 1951 when the mantle of responsibility was transferred from father to son. The retiring president said: "The character of our business has changed greatly since I myself took its leadership more than 50 years ago, but I feel confident that there still is a real future in America for machine tool organizations such as ours.

"I feel certain that under my son's leadership, the company will continue to develop both as an economic asset to our nation and as an example of progressiveness to our New England region."

On the same day, the new president—in a brief, to the point "special letter to the management", made these statements: "In this significant moment, I think we should review together the things which have made Brown & Sharpe successful under my father's 52 years of leadership.

"The rules are simple—there really are only three—but they leave a rich inheritance on which to build our future. These rules are: (1) Make certain that the machines you create really are of good design. (2) Make certain that the integrity of your workmanship is of the highest. (3) Make certain that your reputation for fairness and honesty is never blemished. There is no modern touch that can change these rules on which Brown & Sharpe will continue to operate."

THREE COLUMN PEDESTAL: This week I am in Chicago attending the spring meeting of National Machine Tool Builders' Association. Incidentally, I notice from a historical table in the new Membership Directory sent to me by Mrs. Frida F. Selbert, secretary, that in 1952 NMTBA will be 50 years old.

Within a period of one month it has been my privilege to get an unusual perspective on what I will call the three-column pedestal which represents the American metalworking industry. On April 10 and 11, I got a closeup on big users of machine tools during the Westinghouse Machine Tool Forum at Pittsburgh. On April 18, 19 and 20, I got a closeup on machine tool distribution—this during the spring meeting of American Machine Tool Distributors' Association.

During many years that I was in the machine tool industry, I had a rather dim view of machine tool dealers. Neither did I share with Mr. Statler his belief that "the customer is always right." That was because my associates throughout the industry all were inclined to be that way. The main trouble was that none of us had been around much, none of us knew either dealers or customers as well as we should have known them. Too many of the old line machine tool companies resembled tight barrels of oysters in the shells.

When as an industrial editor, I finally got out of the barrel and out of my shell and got to know many customers and many dealers—I discovered that no three groups in business had less understanding of each other—and were more dependent on each other.

I am happy to say that within recent years this ridiculous situation has been resolving itself a lot faster than has that of the military, naval and air rivalry in our national defense structure. Through affairs such as the forum, the national machine tool shows and the American Society of Tool Engineers' expositions, the rank and file—as well as the high brass—of the user, marketing and manufacturing groups have been thrown together, have gotten acquainted and as Americans do they have found that they had mutual tastes and mutual problems.

Of late years the distributors have been inviting more and more of the builders to their conventions. The builders have reciprocated by inviting more and more of the distributors to their conventions. Both groups have guests from big user companies.

Improved Handling Methods Facilitate Chain Production

Prior to use of these 1000-pound trucks, cans of formed chain were moved from forming to welding department on two-wheel hand trucks. The truck's short overall length and small turning radius permits a high degree of maneuverability

MONTHLY production of several million pounds of chain calls for a lot of handling before the raw material becomes a finished product ready for shipment. Cleveland Chain & Mfg. Co., Cleveland, found that it could cut wasteful handling time and expense to a minimum by: (1) Improving delivery of coiled wire from boxcars to basement storage area; (2) replacing manual with mechanized methods in storing the material; and (3) finding the best means of transporting semifinished chain between production departments.

300 Kinds of Chain—Approximately 300 kinds of chain are made by the company. Since the greatest portion of the output is devoted to chain made from wire, the plant uses, on an average, one boxcar of the material per day.

Wire is shipped to the plant in 150-pound coils which are nested in boxcars to conserve space. At the time of unloading, these coils are either placed on a gasoline-powered truck or rolled to a chute which delivers them to the basement storage area. The truck is used in boxcar unloading operations only when the material is to be stored in the first floor storage area or in the four-slide (weldless) chain department. It is of the nonlift load carrier type which carries the load "in-board" in a pair of parallel frame members.

Two unusual techniques have been developed to handle the coils in its basement storage area. At first, the handling presented a problem. Height to which some coils had to be lifted to the top of stacks eliminated consideration of manual methods; and other equipment which was available to do this work did not fall within the company's budget.

Coils are first rolled down a chute slightly wider than the thickest coils and are slowed down in a 55-foot long run-off section. From here to the storage area the coils are handled manually by a stacking crew who roll them along the floor to their destination.

Coils Stacked Horizontally — To conserve storage space the coils are stacked horizontally in a woven fashion. This stacking is done with the aid of a unique machine, designed and built by Cleveland Chain to suit their own needs. The coil stacker has an electrically powered platform (slightly larger than the diameter of the coils) which lifts the coils to the desired height. Operating procedure with this machine is to roll the coils on the platform, which is at floor level, allow them to drop flat, and then raise the platform to the proper height from where the coils are flipped off to the pile.

The machine is also used in removing coils from the stacks, in which case the coil is slid from the stack to the elevated platform, the platform then being lowered. With the chute and stacking machine combination an average of 200 coils are unloaded and stacked in an hour.

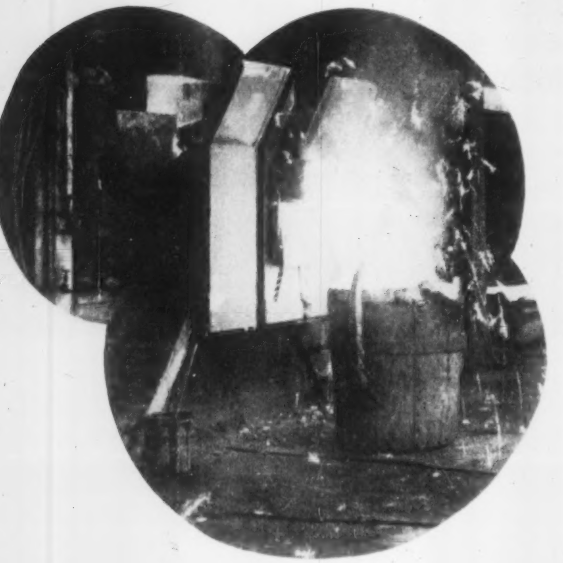
When the material is needed by first floor production machines it is delivered by one of the coil handling trucks to the opening between the first floor and basement for removal by the overhead crane which operates on the first floor. The crane, using a hairpin hook, removes the entire truckload of ten coils at one time. Coils are then transferred to another coil handling truck which delivers them to the forming machine.

Chain Can-Carried—Formed chain is carried to the welding department in chain-handling cans by two 1000-pound capacity battery-powered fork trucks. Formerly, two-wheel hand trucks were used in this operation. The Baker fork trucks have been modified by Cleveland Chain to handle cans without the use of forks or pallets in order to eliminate unnecessary handling. These trucks have a stub fork mounted on the carriage which slips under the load and a latch which grips the rim of the can to keep it securely in place. Since approximately 90 per cent of the company's products is welded chain, these two trucks are kept busy transferring the material between forming and welding machines. One of the FQ trucks is employed during two 8-hour shifts while the second is in operation during one shift.

These two trucks operate within very close margin of their maximum availability. To handle the finished products, they operate approximately 350 hours per month. This is very good utilization of truck time, and this estimate does not account for the chain made in the four-slide department, nor for such factors as slowing down for intersecting aisles, making turns, and for spotting and picking up loads.

Foundry Modernization Ex

An efficient layout based on mechanized handling methods handles the output of two new cupolas producing 10 to 14 tons of metal per hour. Castings weigh from ¼-pound to 30,000 pounds



Tapping one of two cupolas in National Supply Co.'s modernized foundry. Each cupola produces 10 to 14 tons of iron per hour

AN INCREASE in gray iron casting capacity with greatly improved overall operating efficiency through mechanized handling methods were the motives behind a thorough foundry modernization program recently completed in the National Supply Co.'s Engine Division plant at Springfield, O. This $1,250,000 project gave the foundry the most modern equipment available and the most efficient layout for handling the output of two new cupolas.

The cupolas are of the latest type, each having a capacity of 10 to 14 tons of metal per hour. Although they have been operating on alternate days, they will be operated simultaneously whenever combined company and jobbing operations require.

¼ to 30,000-Pound Castings—Castings so far produced range from ¼-pound to 30,000 pounds but castings as small as ½-ounce can be produced. Typical parts made in jobbing operations include cover plates for a mill base, high pressure valves, housings, gear boxes, transmission cases, kiln cars, grinder boxes, lathe bases and many others. The many castings for Superior and Atlas engines range from bed plates to pistons and valve guides.

All metal produced is high test cast iron. To assure a close-grained high-test metal, the iron is inoculated at the spout by additions of refining and deoxidizing agents. Any range of physical properties up to 60,000-65,000 psi tensile strength can be produced and alloys are added when specified. Metallurgically, the cast iron is produced with graphite A, flake, size 4 to 5 finely dispersed with a pearlitic matrix.

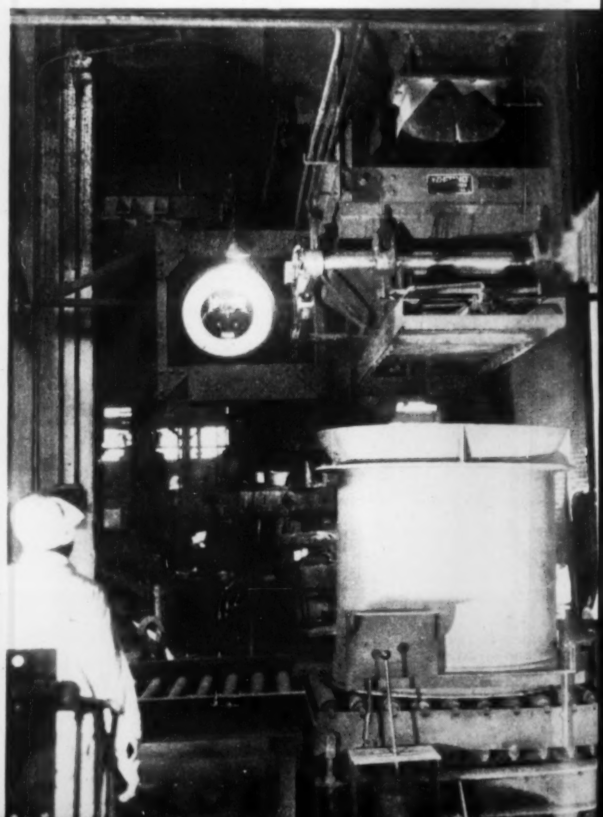
Two annealing furnaces are used to relieve stresses in castings. Heat treating temperatures are accurately maintained by automatic controllers. One of these furnaces has a program control that follows a predetermined thermal cycle automatically to produce the desired metallographic structures.

No. 1 Factor: Mechanization—Mechanization is one of the principal factors in the modernization program. Starting with monorail charger, a unique integral retractable boom that supports the cone bottom buckets eliminates the conventional method of resting the buckets on a cupola boom. The nearby pickup of raw materials on a "merry-go-round" roller conveyor was also planned for high efficiency.

Five cone bottom charging buckets are kept working in a cycle. Empty buckets returned by the monorail charger move by gravity on the rollers under a hopper to receive a weighed amount of metal. A roller-top cable car in the conveyor line then transfers the bucket to coke and limestone weigh hoppers. The bucket is then tilted hydraulically on the cable car until it rolls onto the conveyor on which it moves by gravity to the position for pickup by the charger.

An 80-foot span, 7½-ton yard crane with 55-inch diameter electromagnet breaks and transfers scrap iron from outdoor storage bins to weigh hoppers. A drop-bottom bucket is used to transfer coke and limestone from hoppers under the railroad siding to storage bins. Air-operated slide gates in the track hop-

Coke and limestone weighing station feeds cone-bottom cupola charging buckets on the merry-go-round conveyor



on Expands Gray Iron Casting Capacity

per allow the material to flow by gravity into the bucket. Crane handling by this method is not only efficient but it minimizes coke breakage, thus assuring proper size for the cupolas.

All molds are within 100 feet of the cupolas. An overhead crane handles ladles of 1500 to 13,000-pound capacity and a track car transfers 500 to 1500-pound capacity to pouring positions.

Core Room Handling—The core room was completely rearranged and enlarged. A 44-foot traveling crane span serves large coremaking operations and car-type ovens. A new vertical tower type core oven designed for gas or oil fuel was installed, and several of the car type ovens converted to use both fuels also.

Roller conveyor systems move core assemblies directly into drying ovens and deliver large assembly cores into the main bay of the foundry. They also modernize the layout for bench coremaking by feeding cores into the vertical tower oven and out again to the small core assembly system.

Silos for Core Sand—Three weather-proof silos, 14 feet in diameter and 40 feet high handle core sand. A belt conveyor picks up the dry sand as it is plowed out of closed box cars into a hopper adjacent to the track and elevates it to a platform where it is plowed off into any of the three silos.

Mechanized equipment in the silos keeps sand available at spouts from which it flows by gravity into weigh hoppers above the sand muller. Different type sands are thus combined readily in specified proportions. Water and core oil are piped into the muller, the quantity being meter controlled. Timers automatically regulate mulling action.

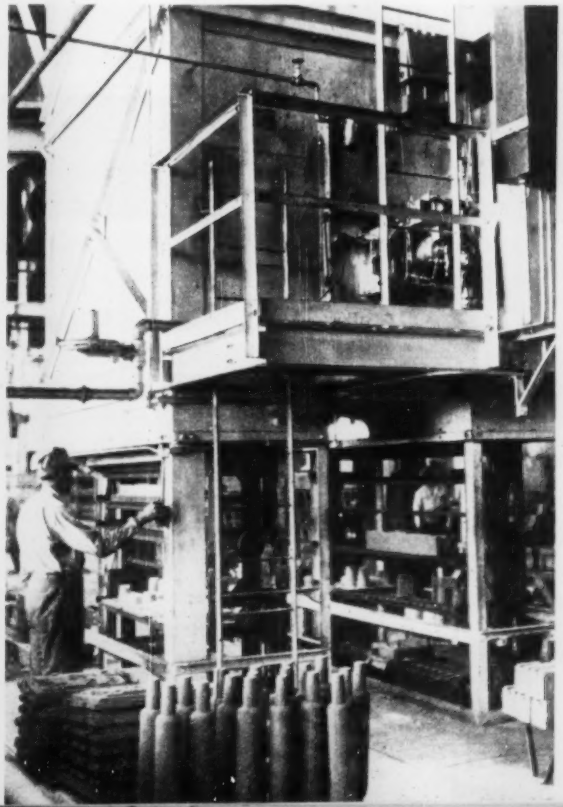
New core knock-out equipment eliminates manual operation and prevents air contamination. Dust and fumes are disposed of by an exhaust fan and two modern wet type dust collectors, improving working conditions not only at the shakeout but also throughout the foundry. Used core sand is shaken onto a metal apron conveyor that disposes of it into overhead bins for future disposal.

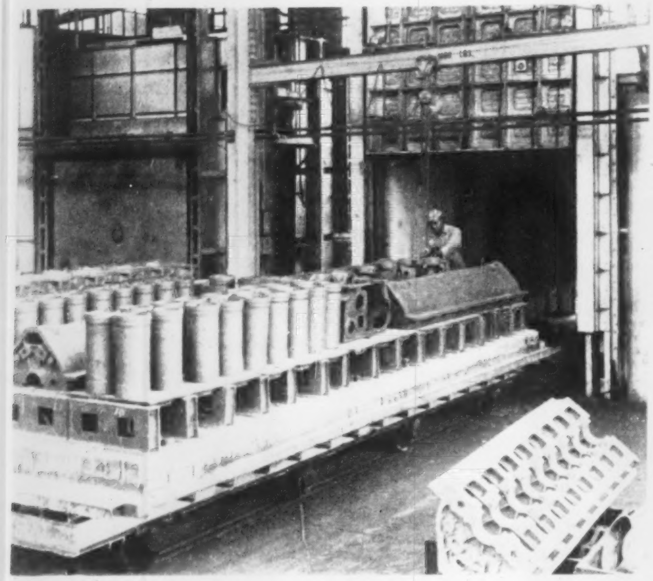
Molding Sand Received Dry—Molding sand, like core sand, is received dry in closed box cars. This sand is plowed out of the car into a hopper where it is picked up by a mobile conveyor belt and deposited into an elevated hopper. This hopper feeds an enclosed conveyor belt that carries the sand to the top of concrete storage bins where it is plowed off into stalls.

Sand handled by the sand slinger is received from an overhead hopper fed by belt conveyor. The sand slinger serves many stations along a track running the full length of the molding floor. Molds are rammed by centrifugal force instead of by hand or machine jolting.

Pouring diesel engine cylinder heads. All molds are within 100 feet of the cupolas, with crane and track car handling ladles

Roller conveyors feed cores into this vertical tower-type core oven and then transfer them to the small core assembly system





Carload of iron castings being readied for the annealing furnace. Temperatures are accurately maintained by automatic controls

Mold shakeout equipment is similar to that for knocking out cores and serves also to minimize sand loss. Vibration of the shakeout equipment loosens the mold sand and allows it to drop through a table grating into a feeder for a revolving barrel or cylinder approximately 6 feet in diameter and 37 feet long. This barrel riffles and cools the sand, adding water automatically when necessary by means of a thermostatically actuated valve. Screens at the exit end remove foreign matter.

The sand passes through the screen and feeds onto a conveyor belt that deposits it into a vertical elevator. A magnetic pulley at the elevator further rids the sand of metal that escapes the screen. At the top of the elevator the sand is deposited onto a belt conveyor that carries it above the large steel storage hoppers.

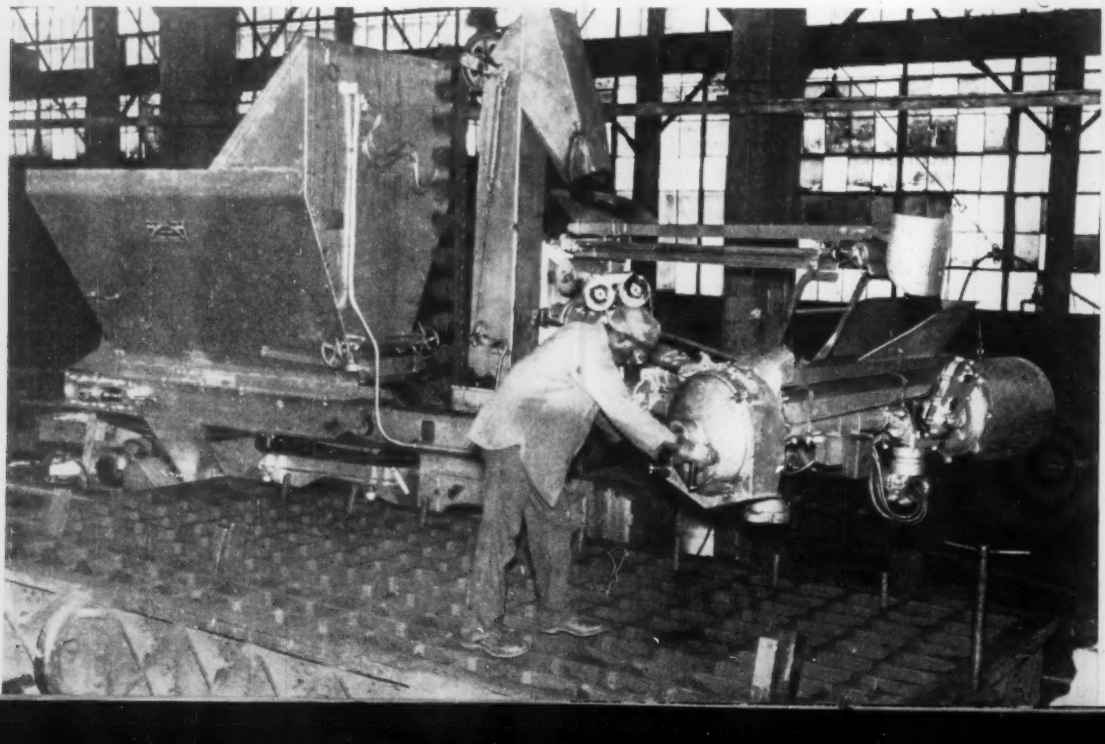
New and old sand in these overhead steel hoppers are proportioned by means of a movable weigh lorry traveling under all bins and dropping into a molding sand speed muller. Mulled sand is ejected onto a belt conveyor where it is transferred to an elevator and then to belts that distribute sand to molding stations and hoppers.

Boardless Hammer Going Strong

Since introduction of the Ceco-Drop, a gravity drop hammer, by Chambersburg Engineering Co., Chambersburg, Pa., a little more than three years ago the company has completed 100 hammers of this type. As of Mar. 1 there were 96 in service and 65 on order. It is popularly known as "the boardless gravity drop hammer" and was developed by the company as an improvement over the board drop hammer which has been one of its main products since 1912.

In the Ceco-Drop the ram is attached to a piston operating in a cylinder instead of being fixed to a board operated between rollers as in conventional hammers. Ram is raised by air or steam to the top of stroke at which point the air or steam exhausts and the ram drops by gravity. Other advantages are: Lowered center of gravity resulting in more accurate die match, faster striking action, quicker ram getaway after striking, shock and vibration reduced and greater safety. Despite industry's acceptance of the boardless hammer the company continues to make many of its standard board drop hammers and makes no prediction that the newer unit will ever completely replace the standard units.

Molds are rammed by centrifugal force. This mobile sand slinger travels on a track the full length of the molding floor. It receives sand from an overhead hopper fed by belt conveyor



HOW TO STRETCH YOUR FLAT ROLLED STEEL SUPPLY

- A ton of steel in any form contains slightly under 7059 cubic inches.

- Dividing 7059 by the product of length, width and thickness used for each unit of production will give you the number of parts you can theoretically expect to obtain from each ton of cold rolled strip steel.

- If you can reduce any of the three dimensions, the number of parts you get will be increased.

- Length and width may be difficult to change but if you can design or redesign the part to use a lighter gauge, you can make an important increase in number of parts per ton.

- For example, cold rolled strip steel 2″ x .015″ averages approximately 19,600 feet per ton; 2″ x .010″ averages approximately 29,400 feet per ton. *Thus, a reduction of one-third in the thickness would effect an increase of 50% in the number of feet (or parts) per ton.*

- If you are using CMP Thinsteel, it may be possible to make such a change without sacrificing strength as Thinsteel, in all analyses, can be produced to a wide range of physical properties.

- In addition, you are insured maximum number of parts per ton because oversize variation, bothersome source of footage loss in ordinary flat-rolled steel, is kept to the minimum by CMP's precision rolling processes.

- Demand for Thinsteel far exceeds supply these days and defense order requirements further limit availabilities, even to old customers, but where CMP Thinsteel can be furnished we suggest this practical approach to stretching supply—wherever possible reduce gauge thickness and get an automatic dividend in increased footage available for productive purposes.

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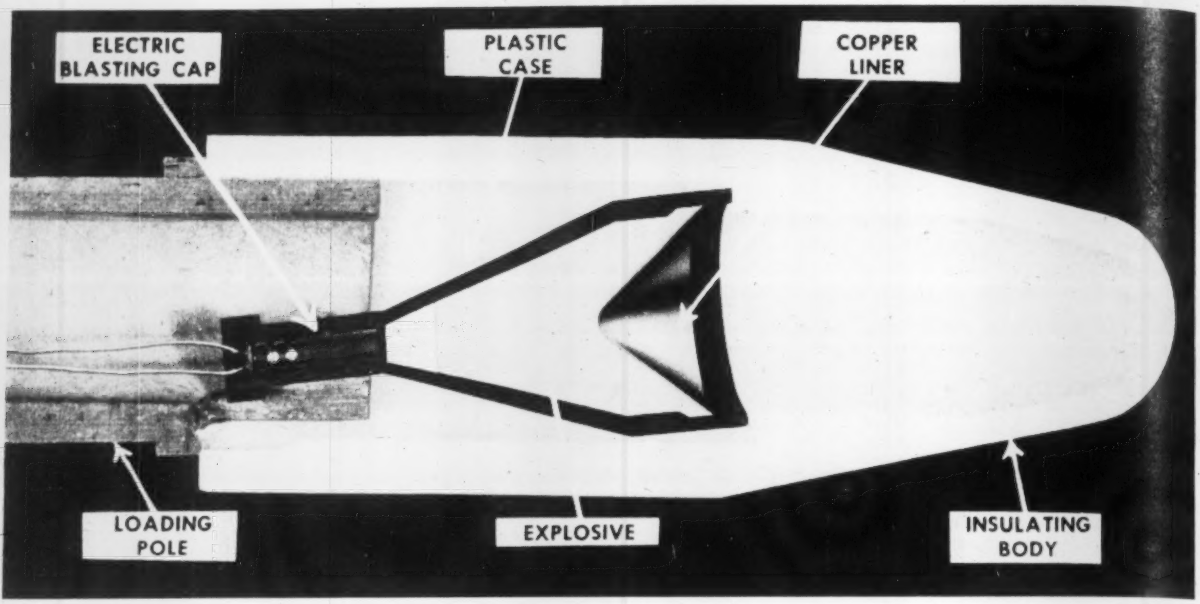


Fig. 1—Cross section of Jet Tapper showing various components

Open Hearth Furnaces "Jet Tapped" in 30 Seconds

Full initial flow of steel reduces tapping time, taphole maintenance and skull production and contributes to increase output of open-hearth shop. Bazooka-type projectile fired with complete safety. Procedure for assembling, storing and detonating the casting device is explained

OPEN-HEARTH furnaces now are being tapped with small high explosive charges which penetrate through more than 6 inches of steel. This new tool—a development of E. I. du Pont de Nemours & Co., Wilmington, Del.—is a peacetime application of the so-called "shaped charges" which were developed during the war for penetrating armor plate and concrete fortifications. Most famous of the military shaped charges was the rocket-propelled, tank-stopping bazooka.

Construction—The tapper consists of a 2-ounce explosive charge enclosed in a plastic case which is surrounded by a hollow bullet-shaped insulating body with walls ½-inch thick. Key to the penetrating power lies in the thin copper cone imbedded in one end of the explosive charge as shown in Fig. 1.

The explosive used in Jet Tappers is relatively insensitive to impact, friction, and other causes of accidental explosion as compared to most commercial explosives. If heated to a sufficiently high temperature, it will burn, but will not detonate. For example, in one test, a case containing 24 tappers was completely burned in a bonfire of kerosene-soaked wood without any sign of a violent reaction. In another test, six tappers were laid side by side between steel plates and a 150-pound weight was dropped 9 feet onto the upper plate. Although the charges were completely crushed, there was no evidence of detonation.

In practice, these tappers are detonated by a special high-temperature electric blasting cap situated in a well in the back of the plastic case. Although the caps will eventually detonate voluntarily after prolonged exposure to temperatures over 500°F, experience has shown that they will stay in a hot taphole for 3 to 8 minutes without detonating when they are used in conjunction with the tapper assembly.

Shaped Charge Principle—Opening of tapholes with

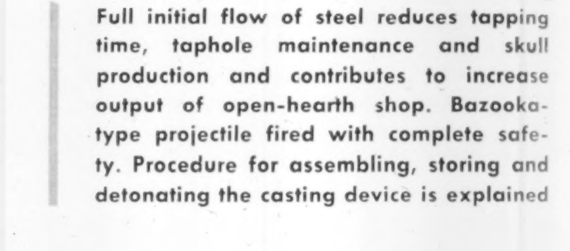
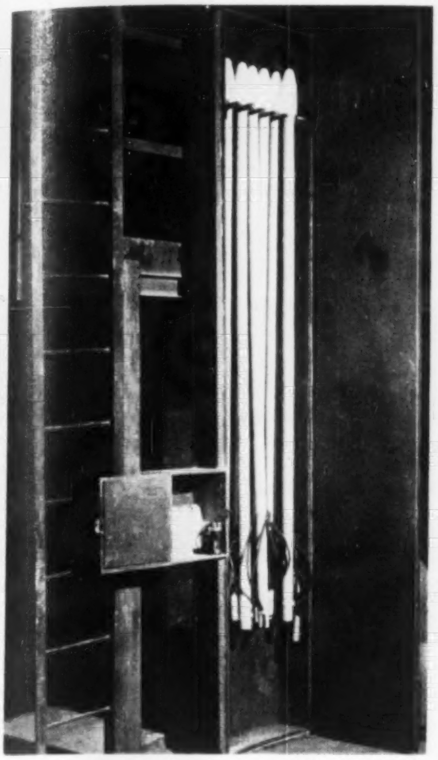


Fig. 2—Cross section of open-hearth taphole showing loading pole and projectile in firing position



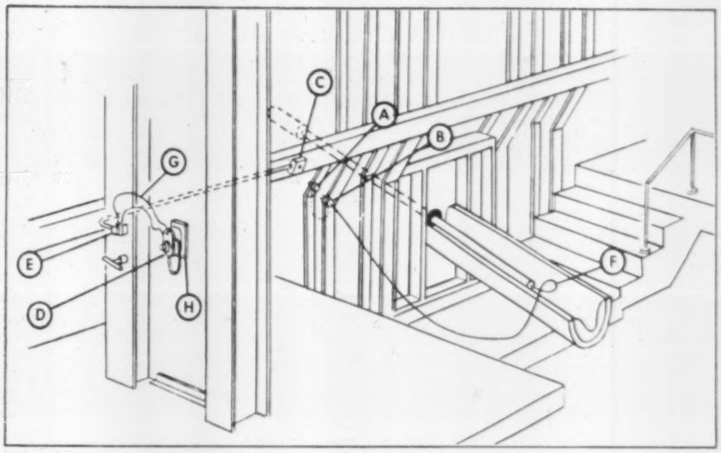


Fig. 3 (left)—Cabinet for storing daily supply of projectiles and blasting caps

Fig. 4 (above)—Diagram of firing circuit. A, shunt, B, plug; C, receptacle; D, blasting machine; E, interrupter switch; F, connector cord; G, blasting machine leads; H, blasting machine bracket

shaped charges is the result of projectile action rather than blast effect. When detonated, the Jet Tappers create a high velocity jet of tiny copper fragments. The individual particles of the jet have velocities up to ten times as fast as a rifle bullet. By virtue of its high speed, the jet contains an enormous amount of energy which is concentrated against a small area when it strikes the taphole facing. The extremely high pressure resulting from the process causes the facing to flow like a liquid from the path of the jet. The hole is continually deepened by successive impacts of copper fragments until the jet is exhausted. Although the jet is of relatively small diameter, the radial flow it induces in the facing will produce a hole many times larger than the jet itself. The actual diameter of the hole depends upon the temperature of the "target". For example, at atmospheric temperature the jet would make a hole about $\frac{3}{8}$-inch diameter in steel, whereas it would make about a 1-inch diameter hole at 1500°F. It is for this reason that a jet tapped hole almost always starts out at full flow.

Tappers will penetrate more than 6 inches of cold steel. Although they would go somewhat farther through hot steel, target temperature has less effect on the depth of penetration than it has on the diameter of the hole produced.

Tapping Procedure—Jet Tappers and electric blasting caps are supplied as separate units and must be assembled together with a loading pole and connector cord before use. The loading pole is merely a spiral-wound paper tube 8 feet long and 2 5/32 inches diameter. The connector cord is a 14 foot length of rubber insulated duplex wire, one end of which is connected to the blasting cap wires and the other end to a shunted plug.

Assembled tappers are placed in daily supply cabinets (Fig. 3) conveniently situated on the furnace floor. It is recommended that one man be given the responsibility of obtaining charges from a central storage magazine daily, assembling them with the blasting caps and loading poles, and delivering them to the daily supply cabinets. The assembly operation of the tappers takes no more than 10 minutes per charge.

After the assembled charges have been placed in the daily supply cabinets, it should be the melters' responsibility to see that they are delivered to the proper furnaces just prior to the tap.

Preparation of the hole for jet tapping should be the same as for oxygen lancing. However, it is even more important for jet tapping that all loose dolomite be cleaned out of the hole so that the tapper can be pushed all the way up to the facing of the taphole.

Safety Factors Are Involved—While the hole is being cleaned out, the blasting machine should be placed in its bracket and connected with the electrical circuit. The handle of the blasting machine should be retained in the possession of the man who is to place the tapper in the hole until the charge has been fired.

When the hole is ready, a tapper is inserted into position as shown in Fig. 2. If, for any reason, the charge should fail to fire, no attempt should be made to remove it from the taphole. The cap will be detonated by heat within 3 to 8 minutes and will destroy any remaining explosive with an audible report. When the charge has fired, it can be replaced by another charge or the hole can be lanced at the discretion of the melter.

Jet Tappers are not recommended for use if there is any indication that a heat is likely to break out of its own accord. Although tests have indicated that the cap will not detonate for at least a minute even if the assembly is floating on molten steel, this potential hazard should be avoided. (*Please turn to Page* 78)

CONTINUOUS ANNEALING

...Arousing Industry Interest

By W. R. WEIR
Dominion Foundries and Steel Limited
Hamilton, Ont.

This process in which a single strand of steel is annealed and cooled in less than 2 minutes —although in use for at least 10 years—has just recently received serious consideration from cold-rolled steel producers

EVER SINCE the modern cold strip mill replaced the hot pack mill for rolling sheets of tin plate gage, the need for carefully controlled bright annealing has received an increasing amount of study by steel mill engineers. Bright annealing is necessary to relieve stresses caused by cold rolling and, at the same time, to protect the smooth cold-rolled surface.

There are two methods of bright annealing used in the steel industry at present. The most common, the batch anneal or process anneal, is carried out under separate hoods in coil form with furnace cycles from 40 to 100 hours. There have been many changes in cover furnace design and practice during the past 15 years, but in spite of different forms of heating and high speed atmosphere circulation, variations in annealing steel persist. This is to be expected in an annealing process designed to heat coils with a thickness of as much as 20 inches which, for the purpose of heat treatment, must be considered as almost solid blocks of steel.

The newer form of annealing is carried out in a continuous strip annealing furnace in which a single strand of steel is annealed and cooled in less than two minutes. This form of annealing, although in use for at least 10 years, has just recently received serious consideration from producers of cold-rolled steel.

Line Components—The line consists of four units; Conventional striphandling equipment, double payoff, welder, loopers, coiler, alkaline strip cleaner, four-section heating furnace, and eight sections of cooling chutes. It is designed to anneal cold strip up to 34 inches wide of 0.0067 to 0.025 gages at speeds up to 300 fpm for 0.010 gage strip.

The entry section of the line has a double cone-type pay-off so that one coil may be welded to the next with a minimum of delay. A 7.5 kw drag gen-

Fig. 1 (below)—Entry end of the continuous annealing furnace, showing the pay-offs, cleaning unit and looping tower

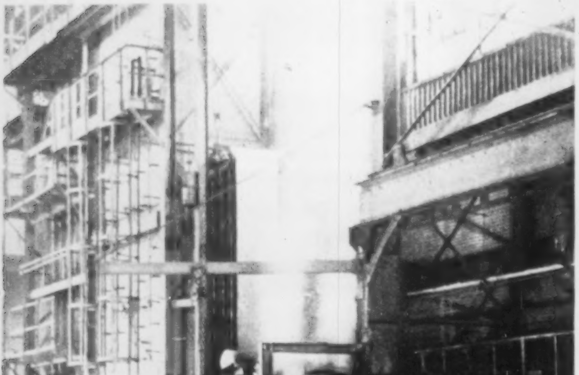
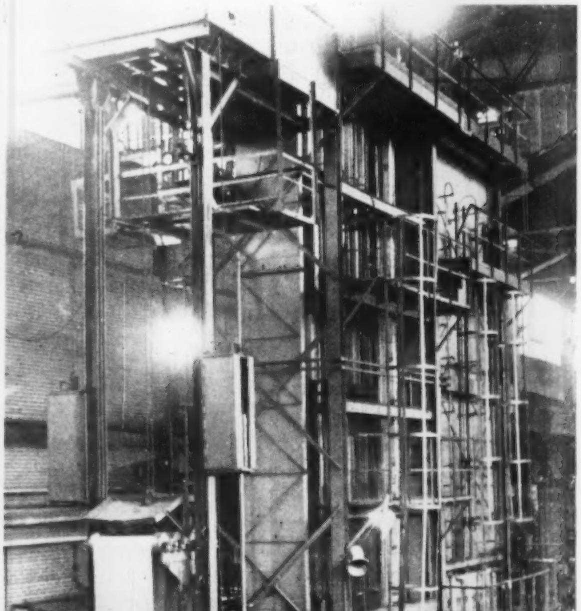


Fig. 2 (right)—Exit end of the continuous annealing furnace. Exit operator controls annealing temperature from panelboard seen in foreground



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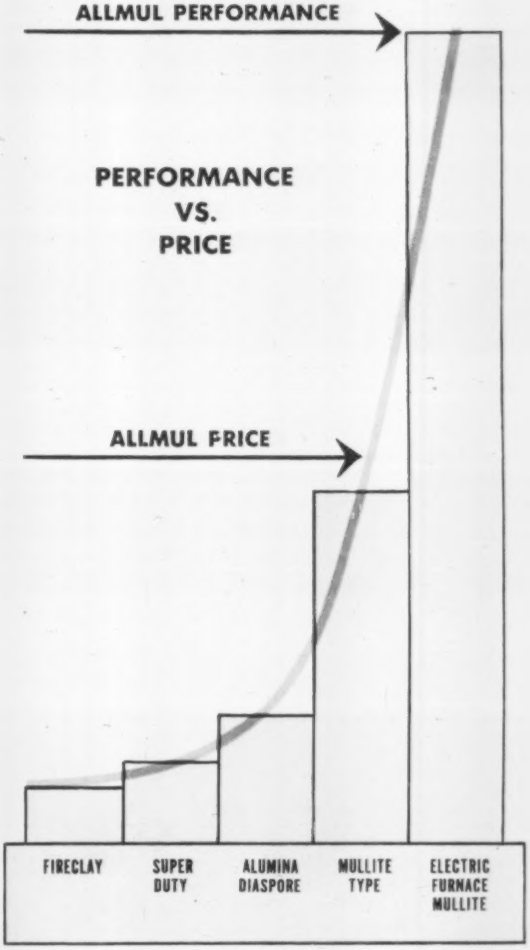

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B&W REFRACTORIES PRODUCTS — B&W 80 Firebrick • B&W Junior Firebrick • B&W 80 Glass Tank Blocks • B&W Insulating Firebrick B&W Refractory Castables, Plastics and Mortars • OTHER B&W PRODUCTS—Stationary & Marine Boilers and Component Equipment... Chemical Recovery Units . . . Seamless & Welded Tubes . . . Pulverizers . . . Fuel Burning Equipment . . . Pressure Vessels . . . Alloy Castings erator on the pay-offs provides back tension through the double seam welder and cleaning line to the entry pinch rolls. Strip travels from the welder to the cleaning unit where it makes six 12-foot passes through an 0.8 per cent (Na_2O equivalent) solution of orthosilicate base (Pennsalt No. 32) at 180° F. The solution circulates through a reservoir where it is heated and the oil and grease allowed to overflow. After passing through the cleaning tank strip passes through scrubbers, power sprays and a steam driver. All water used in the cleaning unit is hot water from the furnace's cooling section.

A 25 hp dc motor powers a pair of rubber-covered entry pinch rolls to pull the strip through the cleaner and into the looping tower. The looping tower holds eight 45-foot strands or 360 feet, the equivalent of one minute storage at a normal operating speed of 300 fpm.

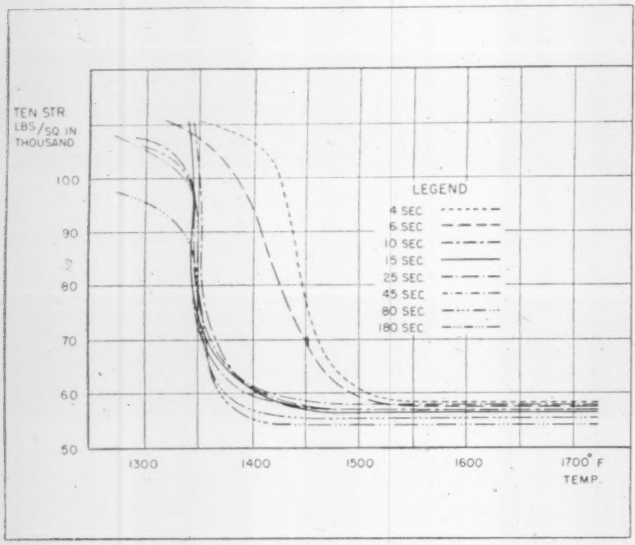


Fig. 3—Effect of short cycle annealing on tensile strength of 0.06% carbon steel, 0.010-inch thick

The furnace is provided with a set of 4-inch diameter entry seal rolls to prevent excessive loss of furnace atmosphere. These entry rolls run on the strip and are backed by asbestos strips secured to the furnace shell.

Design of Furnace—The furnace proper consists of four vertical brick chambers lined on the two broad sides with heating elements. Rolls of 38-inch diameter located at the top and bottom of each heating chamber carry the strip from one leg to the next. These legs are 46 inches wide, 20 inches across and measure 36 feet $2\frac{1}{2}$ inches from the center line of the bottom to the top roll. Furnace legs are encased in a steel furnace shell having doors at the bottom for removing the strip in case of its breakage.

The furnace itself is constructed of 2600° F light weight firebrick. There is a 2-inch layer of insulation between the firebrick and the furnace shell to reduce furnace radiation loss. Resistance elements for heating the strip are carried on refractory hangers built into the two furnace walls. These elements are edge wound from 1 x $\frac{1}{8}$-inch Nichrome strip so that depth of the loops is greater at the center of the strip path than at the edges. This feature induces even temperature across the strip as its edges tend to absorb extra heat from the furnace chamber ends. Eight elements are connected together in series to form one furnace zone with a capacity of 60 kw at 220 v.

Each furnace leg is divided into eight zones and there are 28 zones at 60 kw and four zones at 40 kw or a total of 1840 kw. The 40 kw zones are located at the exit end of the last furnace chamber to provide a soaking period after the strip is up to temperature. At times, these elements are shut off. Power for the elements is brought in at 13,200 volts and stepped down to 220 volts by three transformers located close to the furnaces. The power is controlled by one circuit breaker for each zone operated by on-off instruments. Each furnace leg's eight zones are controlled by three pyrometers, two of which control three zones each and the third, two zones.

In actual operation, the instruments act as an upper limit control only, because strip speed is adjusted so that the elements are kept at a temperature below the instrument setting and it is only when the strip is running abnormally slow or stopped that the instruments function as an on-off control.

Cooling Chute Construction—Cooling chutes are designed to cool the strip while still in the protective De-Ox atmosphere. They are rectangular boxes made of 8 gage steel plate 44 inches wide and 6 inches deep and are 37 feet, $11\frac{3}{4}$ inches from center lines of the bottom to the top roll.

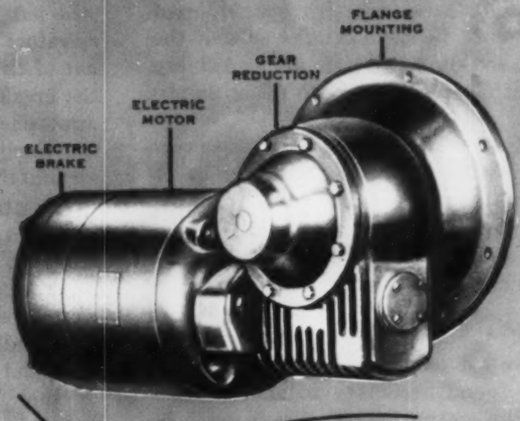
The first chute is insulated with 1 inch of sheet insulation to extend the soaking period and to maintain strip temperature above 950° F. The second cooling chute is uninsulated while the third chute is water-jacketed on both sides. The fourth, fifth, sixth and seventh chutes have six water-cooling coils with propeller fans to circulate the De-Ox gas around the coil to cool the strip. The eighth and last cooling chute is plain. Explosion hoods are provided at the top of each cooling chute to reduce damage should an explosion occur. The water from the cooling chutes and roll shafts is not contaminated and some of it is reused in the strip cleaner. The remainder is piped to the boiler house for boiler feed water. Strip leaves the last cooling chute at about 200° F through seal rolls which again prevent furnace atmosphere from escaping.

The strip enters the master pinch roll which feeds into the delivery looper. This stores sufficient strip at normal operating speeds to allow 30 seconds for removing the annealed coil from the coiler mandrel and for starting the next coil.

In order to wind an even coil with the strip under tension, the coiler is moved laterally to follow the strip. A guide roll pressing on the side of the strip actuates the coiler traverse motor by tripping small limit switches mounted on a bracket on the coiler.

Versatile Electrical Control—For purposes of electrical control the line is divided into three sections;

Paper presented before 1950 Chicago regional meeting of American Iron & Steel Institute.



The power drives on this machine incorporate an electric motor, a gear reduction, an electric brake and a flange mounting . . . all standard Master units that easily combine into one compact, integral power-package that's just right for this machine. This permits many parts to be stripped away from both the power unit and the completed machine . . . makes a job that's all muscle, no fat.

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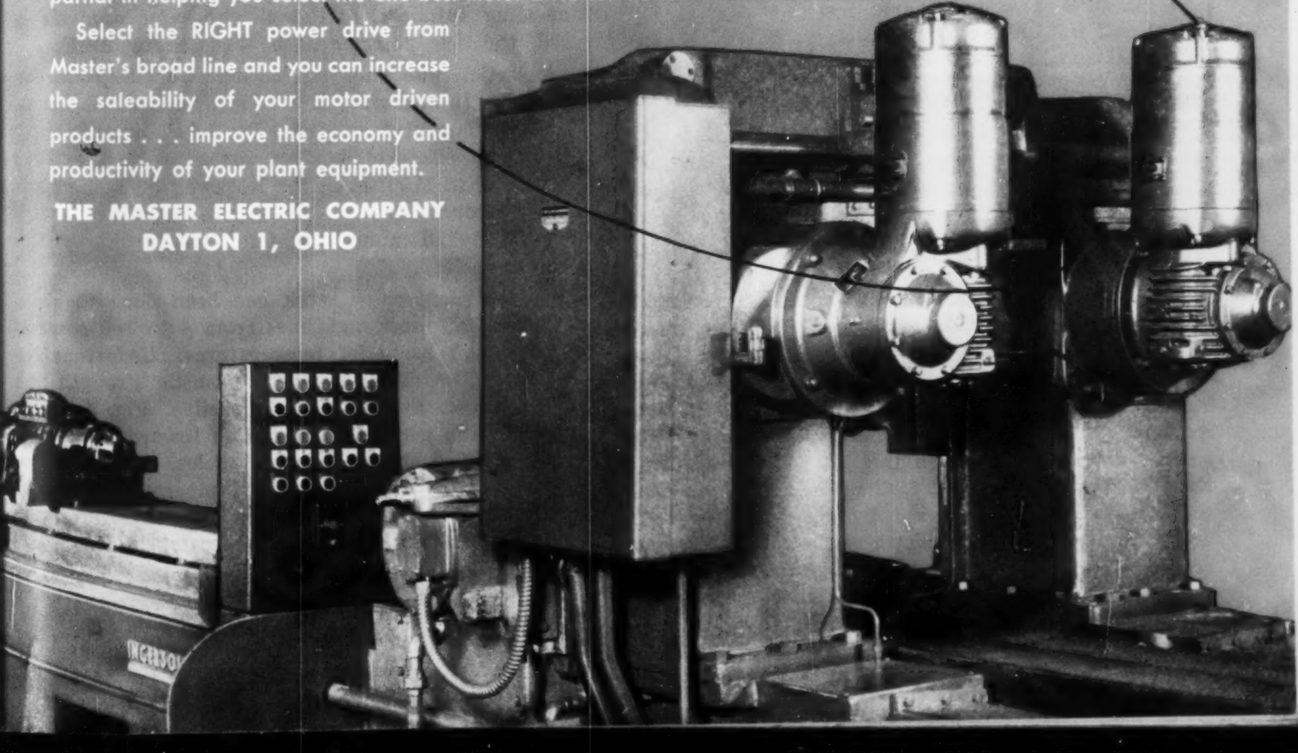


the entry section controlled by the entry pinch rolls; the process section controlled by the master pinch rolls; and the delivery section controlled by the coiler. These three sections of the line are synchronized electrically with a Ward Leonard control so that the whole line may be speeded together. Entry or delivery sections may be controlled separately to fill or empty the loopers.

The loopers are fitted with slack switches and overspeed devices to prevent looper crashes in the event of strip breakage.

The line is controlled from two desks, one at the entry end which controls the pay-offs and entry looper, and a second or exit desk which controls the line speed and the delivery looper. The exit operator also has control of the annealing temperature. A switch is provided to cut off the heat when the strip stops. It has been found necessary to shut off the instruments before the control temperature is reached, otherwise the strip attains a temperature high enough to cause buckling or wrinkling under tension.

Every effort is made to keep the strip travelling down the center of the furnace. This is done by moving the pay-offs laterally to compensate for cambered strip or the entry looper may be lowered to increase tension on the strip. The entry desk operator is careful to cut out any torn edges that might tear off in the furnace.

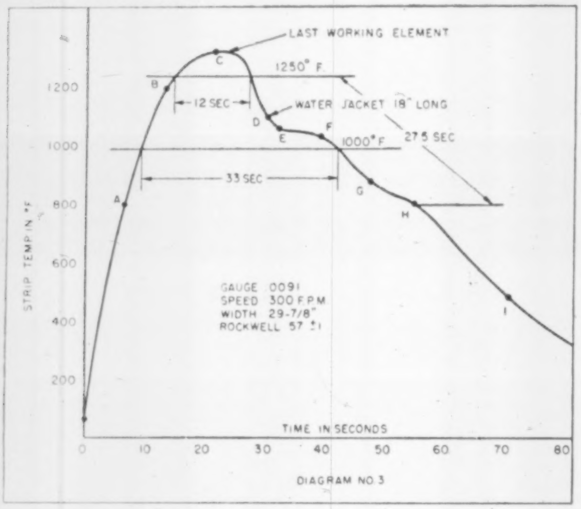


Fig. 4—Continuous annealing cycle for 0.0091-inch strip at 300 feet per minute

Procedure During a Break—When a break occurs, slack appears at the master pinch rolls or the entry looper goes up. The line is either stopped by the slack switch or the operator presses the emergency stop button which sets all the brakes on the line. The location of the break is determined by opening the cooling hoods or looking in the entry seal rolls and the bottom furnace doors. If the break occurs in the cooling chutes it is repaired by removing the top hoods and lowering a wire down either side of the top roll and joining the wires together over the roll. When the chutes are strung where the break has occurred, the wire is joined to the ends of the broken strip which is pulled slowly out of the furnace and production is resumed. As the protective atmosphere is still left in the furnace, operators wear air line respirators to protect them from any atmosphere forced out of the hood where they are working. However, if the break occurs in the furnace, the explosive furnace atmosphere must be removed. This is done by setting the combustor at four air to one gas and bleeding air into the first furnace leg.

The atmosphere is checked in an explosion tester and then the doors are opened and the oxidized strip removed. The furnace is then threaded with wires let down through pipes in the loop hoods in the same manner as the cooling chutes and a Nichrome leader strip pulled in. This is then fastened to the good strip and the furnace is closed, heated and purged of oxygen. The leader strip is then pulled through and production resumed.

About 75 per cent of the breaks are caused by cambered strip hitting the sides of the furnace or cooling chutes and the remainder are caused by poor welds, torn edges, etc. Time lost varies from 30 minutes for small cooling chute breaks to 8 hours for a furnace tear-off.

The line is operated with three men at each shift, the front desk operator, rear desk operator and floor man.

Analysis of Annealing Atmosphere—Annealing atmosphere is provided by a regular DX gas generator burning butane at a ratio of 17:1 or city gas at 2.6:1.

Normal gas analysis is:

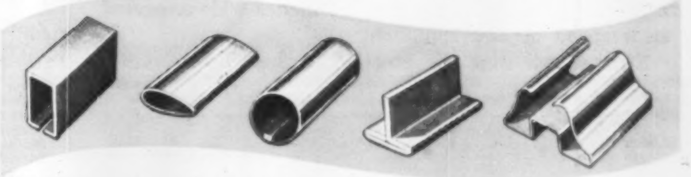
	City gas Per cent	Butane Per cent
Carbon dioxide	4.5—5	5.5—6.0
Oxygen	0	0
Carbon monoxide	9—10	11.0—11.5
Hydrogen	15—16	9.0—10
Methane	0.2—0.3	0
Illuminants	0	0.1
Dew point	85° F maximum	

The high dew point does not appear to have any detrimental effect as far as discoloration is concerned. A dew point this high is not satisfactory for our batch annealing furnaces. Although the same analysis is used, the dew point must be lowered to 40° F.

An article published in *Iron and Steel Engineer* by G. Sacks, L. J. Ebert, A. W. Dava and M. H. Jones, "The Fundamentals of Annealing Low Carbon Steel," shows the effect of various times at temperatures from 1000 to 1700° F on the Rockwell 30-T or superficial hardness tester. The times considered vary from 1 to 120 minutes at temperature followed by furnace cooling.

At our plant some work has been done to show the effect of annealing times from 4 to 180 seconds over a high range of temperatures. Unfortunately it showed the effect on ultimate tensile strength and a comparison of results is not feasible. Fig. 3 shows, however, the general continuation toward high temperatures and shorter heating cycles. These curves indicate that with an annealing temperature of 1360° F an increase of over 25 seconds in time has little effect on the tensile properties.

Time temperature curve for a typical gage and spread is shown in Fig. 4. This represents the heat-



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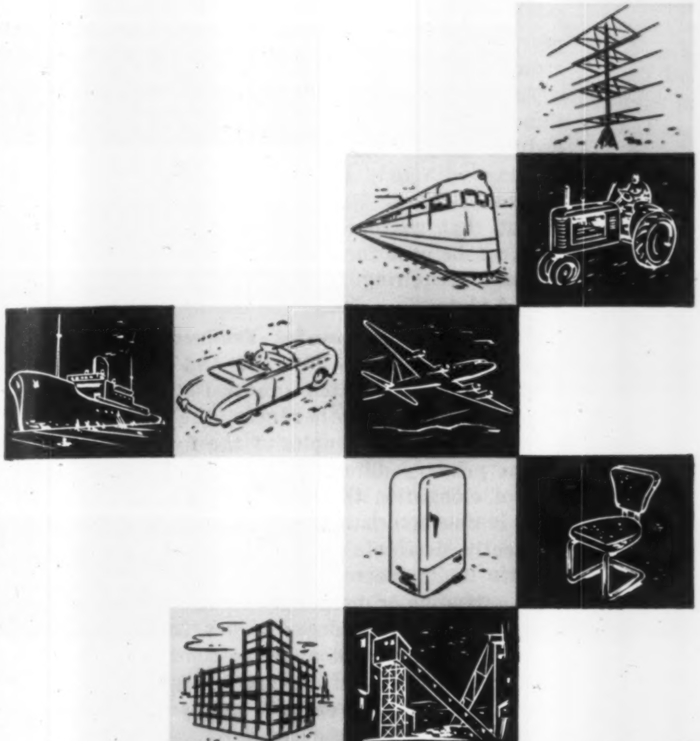

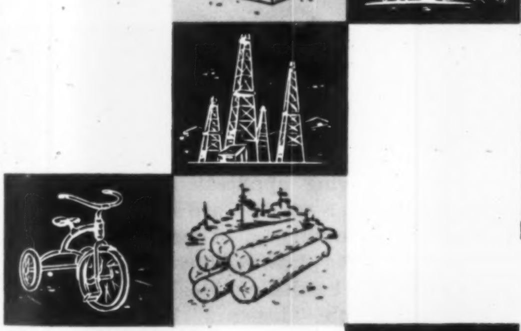

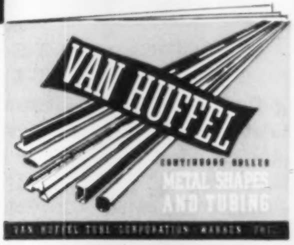
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ing cycle for 0.0091-inch strip 30 inches wide annealed at a speed of 300 fpm.

This shows that the steel is in:

	Seconds
Heating and cooling zones	88
Heating zone	30
Room temp. to 1360° F	24
Above 1000° F	33
Above 1250° F	12

Reason for Unusual Properties—One outstanding characteristic of continuously annealed steel is uniformly fine grain structure which is responsible to a large degree for its unusual properties.

Usual physical tests made on tempered strip show little difference between batch and continuously annealed steel at the same Rockwell hardness, Fig. 5.

Because annealing is done in a single strand the amount of heat entering the steel is equal from edge to edge and from end to end of a coil. Even in the newer convector-type batch annealing furnace, equipped with powerful circulating fans, heat is conducted slowly to the inside of the coils producing some difference in true heating cycles. Approximately 30 per cent of our cold-rolled strip is continuously annealed and the balance is annealed in cover-type batch furnaces. After annealing and tempering, this steel may be tinned in our electrolytic tinning line or hot dip tin pots or it may be shipped as black plate without further treatment.

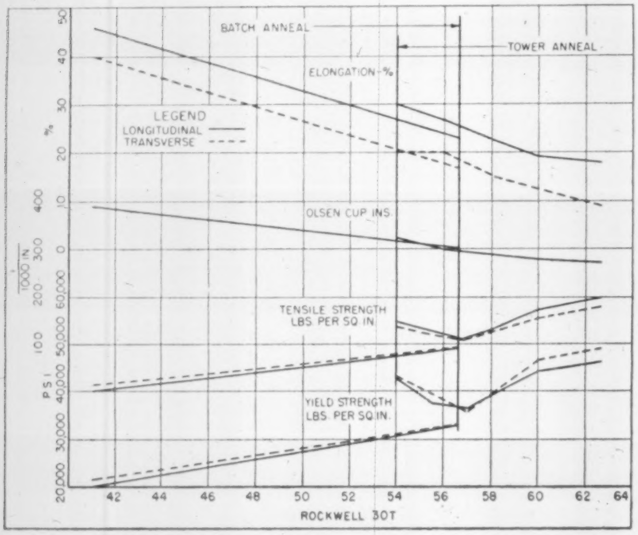

Fig. 5—Physical properties of tempered 0.06 per cent carbon steel at 0.010-inch gage, annealed by two methods

The continuous annealer is limited to strip 34 inches wide and from 0.0067 to 0.025-inch thick. Outside these ranges all steel must be annealed in the batch furnaces. Within this range of gage and width, which includes the major portion of our production, the choice of annealing method is dictated by end use, temper ranges and scheduling and delivery requirements.

The continuous annealing furnace is limited to a Rockwell range above 56 R 30-T, mainly because of furnace design.

This Rockwell range of 56-68 covers the temper specification T-3, T-4 and T-5 and is very useful for the manufacture of food cans where the trend appears to be toward lighter gages and harder temper requirements.

COMPARISON OF CONTINUOUS AND BATCH ANNEALING BASED ON A PRODUCTION OF 5,000 TONS PER MONTH

	Continuous	Batch
Floor space	8675 sq ft	12,175 sq ft
Capital investment	$1.4	$1
Fuel consumption	500,000 Btu/ton	1,000,000 Btu/ton
Atmosphere	822 cu ft/ton	1,370 cu ft/ton
Maintenance	Same	Same
Inventory	100 coils ahead 50 coils cooling	100 coils ahead 400 coils cooling
Labor cleaning	....	0.25 man hrs./ton
Annealing	0.39 man hrs./ton	0.32 man hrs./ton

There seems to be little to choose between continuously and batch annealed steel in normal can body making. The operation is essentially one of forming with only a slight amount of stretching in the end flanges. However, it is becoming more apparent that continuously annealed strip at 60-65 R 30-T can be used for nearly all can making operations normally requiring temper 3, 4 and 5 in batch annealed plate.

Differences in Annealed Product—Although the yield strength, tensile strength and elongation values of continuous and batch annealed steel are similar at any given Rockwell hardness, the lack of necking at the fracture in samples of the former is indicative of the primary difference, showing an even distribution of elongation throughout the entire gage length. This is characteristic of work hardening steel. It is eminently desirable in most drawing operations but has its limits where localized stretching is required, as in extruding or dimpling.

The Rockwell hardness values for drawing batch annealed plate do not apply to continuous plate. Our service engineers and an increasing number of users have found that an entirely new set of values must be applied.

Some of the applications which normally require a T-2 steel (50-55 R 30-T) are regularly made from T-4 continuously annealed steel at 60-65 R 30-T, i.e., crown caps, medicine bottle caps, shoe polish tins, catsup caps, muffin cups, sardine cans, drawn tins for meat paste and many other similar types of cans.

Most of the drawing applications mentioned are typical of those which we feel are more satisfactory when annealed continuously. These are all single stage, high production drawing operations for which fine grained, work hardening steel is suitable and where a freedom from "dog-ears" is a necessity.

Dog-earing or petalling at one time was a constant source of complaints to us on many of the above drawing operations. Since installation of our continuous furnace, there is not a single case on record of this difficulty concerning plate annealed in this manner.

There is some evidence that shear and die life is appreciably increased, probably due to the fine grain and work hardening properties which tend to reduce shear drag. This is most evident where users have long production runs of this material and are able to reduce die and shear clearances, thus receiving a cleaner cut. *(Please turn to Page 84)*

Proper Design Improves Defense Materiel Efficiency

By JEAN O. REINECKE
Reinecke and Associates
Chicago

DURING normal times, the industrial designer develops products to sell fast and profitably. He considers the factors of form, material, function, and size, and creates products which are better looking and more efficient, and therefore more desirable.

But these are not normal times, and the industrial designer who has spent years making products which sell now has a big contribution to make in the design of war materiel and military equipment. He can make this contribution because the very qualities which he habitually gives to civilian production are those which make a tank, gun, mess kit, or sleeping bag more efficient and easier on Uncle Sam's purse.

Designers start with the basic consideration that military materiel must be produced quickly and economically, must be simple to operate, easy to service, be adaptable for shipping, and workable under rigorous operating conditions.

To illustrate the application of good design to military equipment, let's look at a civilian item which has innumerable military uses. In civilian life it is called the Hough Payloader, an excavating, earth moving, and bulk materials handling machine.

Models of the Payloader have just been completely redesigned and restyled. Company engineers, in co-operation with our staff, worked to create a materials handling machine which would be perfectly designed from a mechanical, operational and appearance standpoint. We produced a machine which has demonstrated its civilian value and is now proving—with nothing changed except the color—its important military uses.

The unit was designed and engineered for a specific kind of job. It was not to be a mere assembly of standard parts or just an adaptation of present-day tractors. Their designers wanted a unit that would handle bulk materials with maximum efficiency in a confined space.

An entirely new principle was used in providing better visibility for the operator, and better balance, maneuverability, and traction for the unit. Under this new approach, the engine was placed in the rear and the driver's seat was located directly behind the bucket mechanism.

Because the driver sits in front, he can see his working area and observe every operation of the earth moving scoop without craning his neck. He also has an unobstructed, 360-degree area of general visibility.

The new hydraulic boom control eliminates cumbersome mechanical parts which obstructed the view in older models. This greater visibility is intended to reduce accidents and increase the operator's speed.

Other safety features are boom guards, which eliminate the possibility of the driver's catching his sleeve or arm in the boom as it moves the bucket; hydraulic brakes, a low center of gravity; low load carrying position; fast acceleration; quick operational control; and a small turning radius.

Bulk materials can be easily moved in limited space with this recently redesigned Hough Payloader. Small turning area permits operation in narrow aisles

Steering is easy, and the shock cushioned steering mechanism was designed for comfortable handling. Shifting gears in order to change directions has been eliminated with the addition of a directional travel lever with fingertip control. Otherwise, the operator would have to shift gears constantly—a fatiguing process. Further ease of operation is provided through fingertip hydraulic bucket control and a spring-loaded clutch.

The operator's seat is comfortable because it is wide, soft, and properly located. Though no space has been wasted, the operator's compartment is roomy.

Specially designed transmissions are powerful. Proper weight distribution, concentrated on the drive wheels, balances the bucket and load, and provides good traction and flotation. The unique boom design automatically tips the bucket backward to the carrying position in the first few feet of lifting.

Design modifications which make operation simpler, reduce fatigue, increase visibility, and speed-up action are the very improvements which should be worked into military equipment.

Furnace Jet Tapped—

(Concluded from Page 67)

Firing Circuit—Various parts of the firing circuit and their recommended locations are shown in Fig. 4. The recommended firing circuit is designed to eliminate any possibility of premature detonation of the tapper, either from stray currents or as the result of carelessness on the part of operators. Retention of the shunt on the end of the connector cord until after the tapper has been placed in the hole makes it impossible for an electric current from any source to enter the blasting cap circuit. Even after the shunt has been removed and the connector cord plugged into the receptacle, there is no possibility of detonation from stray currents or static electricity because the blasting cap circuit remains shunted at the interrupter switch.

Detonation of the blasting cap, therefore, requires purposeful depression of the interrupter switch and simultaneous twisting of the blasting machine handle. With this arrangement, it is necessary for the operator to be far removed from the runner when the tapper is detonated and the metal starts to flow. After the tap, the connector cord can be removed and used to make up another assembly.

Field Results—More than 3000 Jet Tappers have been used in the field to date. Of this number, approximately 82 per cent have produced successful taps with the following advantages indicated:

1. The shorter time required to open tapholes permits better chemical control and conserves manganese. Use of Jet Tappers usually makes it possible to open a taphole in 30 seconds. Close control of the tapping time is especially important in adjusting the manganese content of open-hearth steel. In many cases, the desired amount of manganese (in the form of ferromanganese) is charged into the furnace a specified time interval before the estimated time of tapping. If the furnace is tapped too soon after the manganese addition, the manganese may not be entirely dissolved. Any delay after the time required for dissolution will result in loss of manganese through oxidation at the rate of about 0.01 per cent per minute.

In view of the present short supply of manganese, conservation of this material is just as important an objective as the control of chemical composition.

2. Heats brought out with the tappers usually start at full flow rate, thus reducing skull production and minimizing pouring difficulties. When the initial flow from the furnace is slow, the steel freezes when it contacts the cold ladle, forming a skull which must later be reworked. Frozen metal in the stopper well also interferes with the free movement of the stopper during pouring operations. When the initial flow of metal is fast, there is no freezing and hence no skull or pouring problems. In one survey made, the average skull for 184 jet-tapped heats was 1.7 pounds per ton of steel compared with 2.2 pounds per ton for 105 heats tapped by other means. In another survey covering 203 jet-tapped heats the average skull was 1.4 pounds per ton of steel as compared with 2.9 pounds for 323 heats tapped by other means.

Because of the fast initial flow, the average overall tapping time for jet-tapped heats is considerably less than for those tapped by conventional methods.

3. Tapholes are straight and require little maintenance. The unidirectional action of Jet Tappers insures a straight taphole and, therefore, they require little patching and are easily closed up. Experience with over 3000 jet-tapped heats indicate that the blast has no detrimental effect on the taphole or the furnace structure.

4. The need for bars to enlarge tapholes or to knock down ridges in front of the holes is practically eliminated. Because of the better directional control realized with these tappers and because of the larger holes made through the taphole facing, complete and rapid drainage is usually obtained without using a bar from the front of the furnace. In a survey covering 289 heats, only seven of the 184 jet-tapped heats required the use of bars as compared with 85 of the 105 heats tapped by other means.

5. The danger of burns from splashing metal is eliminated since it is unnecessary for anyone to be near the taphole when metal starts to flow.

6. Lower skull production, shorter tapping time, and reduced taphole maintenance tend to increase production capacity. Although the increased production capacity resulting from any of these advantages would be difficult to determine accurately, it is apparent that all of them have the effect of increasing capacity.

Almost all of the unsuccessful tapping attempts could be attributed to one of the following three causes:

1. Improperly closed holes which permitted abnormal metal penetration.
2. Inadequate cleaning of the hole prior to insertion of the tapper.
3. "Low" tapholes resulting from abnormal erosion or from a buildup of dolomite on the hearth bottom.

It is believed that the percentage of successful taps will continue to increase as operators become more familiar with the process and learn how to clean out and close up holes to obtain the best results. Jet Tappers eventually should operate at 100 per cent efficiency; even when operating at 82 per cent efficiency, they seem to offer more than sufficient operational advantages to justify their use.

Future Developments—An important development which appears might be realized through the use of these tappers is the prevention of premature breakouts or blows. Every open-hearth operator is aware of the ever present possibility of a breakout and its attendant danger of personnel. Up to this time, however, no one has been successful in devising a method for closing tapholes which would eliminate this potential hazard. Now that Jet Tappers are in the picture, with their ability to penetrate through more than 6 inches of solid steel, the choice of materials and methods for closing tapholes has been widened considerably.

Acknowledgement is herewith made to Republic Steel Corp., Cleveland and Arthur D. Little Inc., Cambridge, Mass., for their co-operation in planning and conducting field tests on Jet Tappers; and to the former for permission to use Fig. 3.

We are especially grateful to H. J. Walker, J. E. Smith, and H. H. Northrup of the Republic Steel Corp., and to A. R. Almeida of Arthur D. Little Inc. for reviewing this paper prior to publication.

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Embrittling Effect of Steam

(*Continued from Page* 57)

require that the precipitate attain some minimum stage expressed in terms of pressure for an occluded gas phase. Quenching, of course, suddenly sets up the condition for precipitation; and its progress with time then shows up as a spontaneous increase in brittleness, followed later by a decrease as the precipitated gas explodes its way toward the surface along intragranular surfaces, now believed associated with micelle-type groups of atoms from which grains or crystals are presumably constructed.[7]

Distinction Is Drawn—It should be pointed out that the type of brittleness with which one is concerned here is almost certainly the intragranular type, for which the active agent is elemental hydrogen and its method the precipitation of atomic hydrogen to form occluded molecular H_2. The phenomenon commonly referred to as "hydrogen attack" is to be sharply distinguished as a primarily intergranular phenomenon involving gaseous *reaction products* of hydrogen with nonmetallic components in the metal. While "hydrogen attack" is virtually restricted to elevated temperature ranges, and the present hydrogenizing reaction occurs in such a range, the factor of time strikes the distinction.

Hydrogen is injected into the metal by the steam, but the quenching operation stops the internal gas reactions at a period too early to attain important stages of secondary reactions and the hydrogen remaining free in the lattice proceeds to precipitate much the same as though the steel had been heated in molecular hydrogen to produce embrittlement on subsequent cooling. The present hydrogen phenomenon is the "pickling brittleness" type, also observed in "white spots", "flakes", "fish eyes" and the like.

Conclusions—As a result of these observations, one can conclude that:

1. Steam is a powerful hydrogenizer of steel when contacting the metal at elevated temperatures;

2. Bendability values, here obtained by means of a specially devised test, express the damage caused by the hydrogen with good sensitivity;

3. All of the class I (hardenable) stainless steels are susceptible to embrittlement by the steam-metal reaction, and even certain class II steels such as type 430;

4. Type 410, designed for steam turbine service as type 403, will bend a full 180 degrees when quenched

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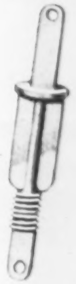

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from a dry furnace atmosphere, but will fracture at angles as low as 15 and 20 degrees if exposed to steam during its hardening heat treatment;

5. This powerful effect of steam in the heat treating atmosphere is realized even within an exposure time of only one minute, virtually the same embrittlement resulting when steam is admitted to a dry furnace atmosphere in the final minute of the heat treatment;

6. Aging steam-embrittled samples in hot glycerine immediately causes a development of hydrogen bubbles and leads to recovery which is more rapid the higher the temperature. For type 410 with its bendability reduced to 20 degrees by steam treatment, recovery during a 2-hour treatment first becomes noticeable above 100°C and is complete above 170°C;

7. Recovery also occurs at room temperature, though much more slowly, type 410 showing little or no improvement for approximately one month, but recovering completely after two months;

8. An "aging minimum" is indicated in the course of recovery, just as observed in earlier work, probably representing a preliminary spontaneous increase in embrittlement resulting from a time factor in the precipitation of the latticularly dissolved gas into the intragranular sites where its effect upon mechanical properties is exerted.

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[3] "A Bar-Bend Test and Its Application to Stainless Steel," by C. A. Zapffe, R. L. Phebus, and F. K. Landgraf, *Trans.* Am. Soc. Metals 42, 666-85 (1950).

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[5] "A Test for Hydrogen Embrittlement and Its Application to 17 Per Cent Chromium, 1 Per Cent Carbon Stainless Steel Wire," by C. A. Zapffe and M. Eleanor Haslem. *Trans.* A.I.M.E., Iron Steel Div. 167, 281-308; disc. 308-12 (1946).

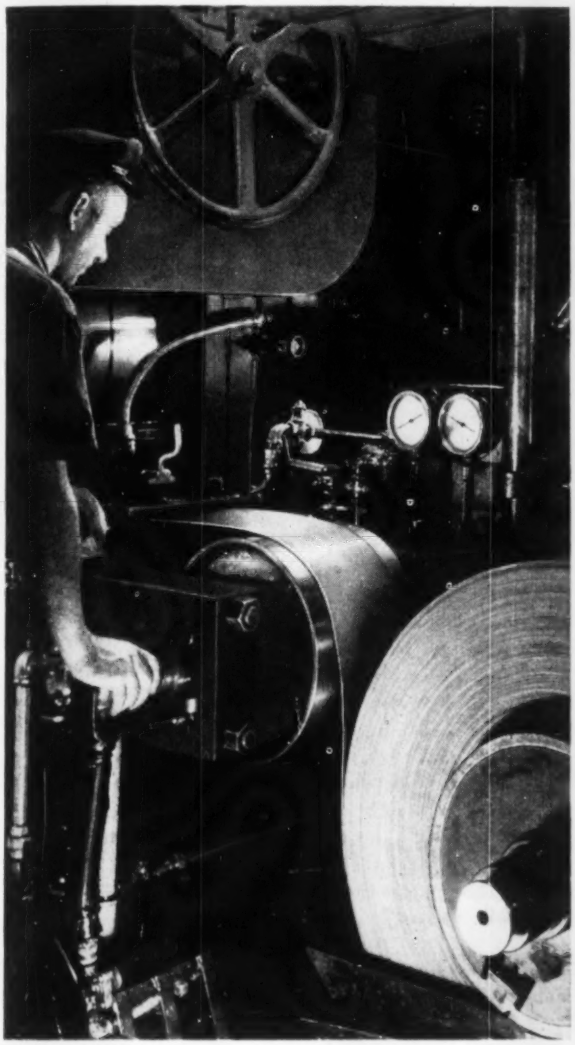
[6] "Measurement of Embrittlement During Chromium and Cadmium Electroplating and the Nature of Recovery of Plated Articles" by C. A. Zapffe and M. E. Haslem. *Trans.* Am. Soc. Metals 39, 241-58; disc. 258-60 (1947).

[7] "A New Theory for the Solid State," by C. A. Zapffe, *Trans.* Am. Soc. Metals 42, 387-98 (1950).

Metal Building Panels Detailed

Fenestra Steel and Aluminum Building Panels is the title of a Detroit Steel Products Co. catalog containing data for architects, engineers and contractors. Catalog provides detailed panel selection tables as a guide to choice of the most economical Fenestra panel for a given span and load.

Details section is revised to repre-



SPRING STEEL

Roebling Cold Rolled Spring Steel brings fewer machine stoppages . . . fewer rejects

YOU SAVE MONEY with Roebling Cold Rolled Spring Steel because it's of absolutely uniform quality. Every inch is just like every other inch, dimensionally and in physical properties. Service records show that it cuts down preparation time . . . gives you a better product and better production. And Roebling Cold Rolled is made annealed, hard rolled untempered; scaleless tempered; tempered and polished; tempered, polished and strawed; and tempered, polished and blued.

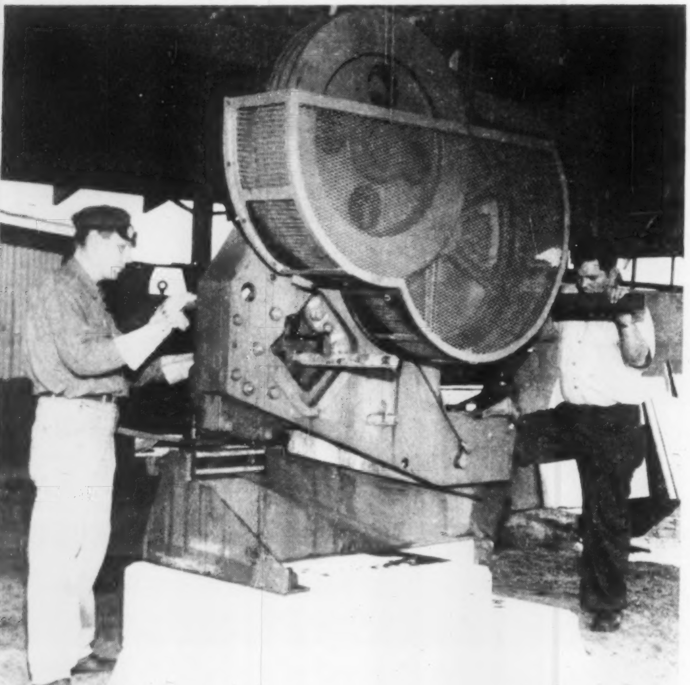
Large quantities of Roebling's specialty wires – flat, round and shaped – are required today in the national rearmament program. Roebling, however, is one of America's largest manufacturers of specialty wires, and we shall always do everything possible to meet your requirements. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING

Atlanta, 934 Avon Ave ★ ***Boston,*** 51 Sleeper St ★ ***Chicago,*** 5525 W. Roosevelt Rd ★ ***Cincinnati,*** 3253 Fredonia Ave ★ ***Cleveland,*** 701 St. Clair Ave, N.E. ★ ***Denver,*** 4801 Jackson St ★ ***Detroit,*** 915 Fisher Building ★ ***Houston,*** 6216 Navigation Blvd ★ ***Los Angeles,*** 216 S. Alameda St ★ ***New York,*** 19 Rector St ★ ***Odessa, Texas,*** 1920 E. 2nd St ★ ***Philadelphia,*** 230 Vine St ★ ***San Francisco,*** 1740 17th St ★ ***Seattle,*** 900 1st Ave, S. ★ ***Tulsa,*** 321 N. Cheyenne St ★ Export Sales Office, ***Trenton, N. J.***

FLORIDA EAST COAST

Keeps 'Em **ON SCHEDULE**



"Buffalo" UNIVERSAL IRON WORKER

Helps Keep Maintenance on Schedule

Above, the "Buffalo" U.I.W. in the St. Augustine Shops of Florida East Coast Railway is simultaneously cutting bar and notching angle. Here's a multi-purpose machine that turns out scores of fabricating jobs in a hurry.

"One of the best labor-saving devices we ever purchased . . ."

. . . that's the word of the Maintenance of Way Engineer of this progressive road. And users in steel mills, other heavy industries, give the same report. For here, in one machine, you can punch, shear angles, cut bars, slit plates, notch and cope—and do it at full speed 24 hours a day. A U. I. W. will pay for itself in your shop in short order. WRITE FOR BULLETIN 322-0, for full details.

Buffalo
Universal Iron Workers
BUFFALO FORGE COMPANY

BUFFALO FORGE COMPANY

158 Mortimer St. Buffalo, New York
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING CUTTING SHEARING BENDING

sent current practice, and the catalog contains numerous photos of new job installations completed in the past year. Complete descriptions of wall, deck and floor panels are included. Catalog is available from the company, 3221 Griffin St., Detroit 11.

Continuous Annealing

(Concluded from Page 74)

Economics Must Be Considered—A comparison of the economics of continuous and batch annealing processes will naturally be affected by location, fuel costs, space limitations and type of product. In a location where gaseous fuels are expensive and electricity relatively cheap, where space is at a premium or where low coil inventories must be maintained continuous annealing offers advantages worthy of investigation.

Some of the factors entering into our cost comparisons are shown in accompanying table using an annealing capacity of 5000 tons per month.

The batch anneal figures are based on an average of 2 1/6 furnaces with 6½ bases, using a charge weight of 90 tons (for capacity of 5000 tons a month in the foregoing table).

Various other considerations are hard to evaluate, particularly the lack of sticker coils with continuous annealing. Also hard to evaluate is the flexibility continuous annealing allows in scheduling which allows certain orders to be completed as much as a week earlier.

Advantages of continuous annealing with the furnace described are of sufficient importance to warrant a careful study of similar but newer and more efficient furnaces by all producers of steel of tin plate gage.

Floor Engineering Pays Dividend

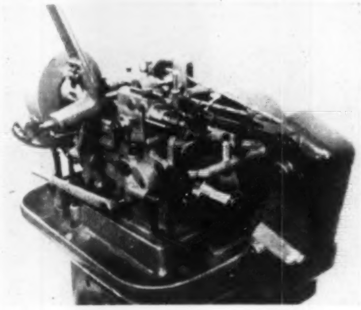
Because the installation of industrial floors for maximum life and minimum cost is a highly specialized task that requires expert planning and skilled technical execution, Flash-Stone Co., Philadelphia, has established an integrated service to industry. Through floor engineering the varied factors affecting floor life are evaluated; the proper flooring material is specified and installed.

Savings from engineered floors are realized through lowered costs, assured maximum life, speeding the movement of material handling, reducing downtime required for installation, eliminating the dust and dirt frequently connected with resurfacing and by the construction of floors having adequate transverse and compression strength.

New Products and Equipment

Fine Cutting Machine

Safag automatic wheel, pinion and segment cutting machine is available from stock in the United States. This machine is constructed by Safag, S.A., Bienne, Switzerland, and marketed in the United States by Carl Hirschmann Co., 30 Park Ave., Manhasset, N. Y. Cutter is known as the No. 118 type 1A, and is developed for production of parts ranging from 0.012 to 0.5-inch diameter. Maximum length for part production is 0.5-inch.



Machine is an indexing type with one or two cutters and is available with or without magazine feed. Two cutters held on the same spindle are used for cutting pinions with fragile and small pivots, for hard material, or with special tooth shapes. Machine can produce gears and pinions with 6 to 60 straight teeth in one cut. Maximum stroke of the cutter slide is 0.5-inch.

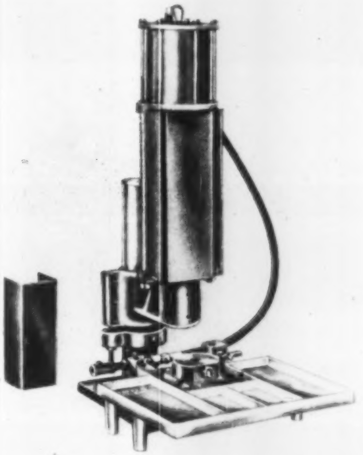
Clamp Eliminates Pallets

Clark Equipment Co., Industrial Truck Division., Battle Creek, Mich., announces a heavy duty clamp for handling heavy, bulky loads without the use of pallets. Device is similar in design and construction to the standard Clark clamp but features heavier slide arms and guides to permit increased arm travel.

Hydraulically actuated, clamping pressures up to 6000 pounds at the heel of the arms are possible. Separate cylinders power each clamp arm and an auxiliary valve controls the clamp. Check valve is incorporated in the system to prevent loss of clamping pressure. Clamp may be extended from 24 to 95 inches and is 67 inches in width with arms closed.

Staking Press Announced

Winter Products Inc., Bridgeport, Conn., announces an air-powered bench-type press for light staking, forming, riveting, punching and similar operations. The press, designated as model RR-6A, can optionally deliver up to 60 spring-powered blows per minute with variable impacts up to 12,000 pounds, or an adjustable air-powered squeeze up to 12 times the air-line pressure. Control of stroke and impact make it suitable for delicate marking operations since there is no rebound to mar the work.

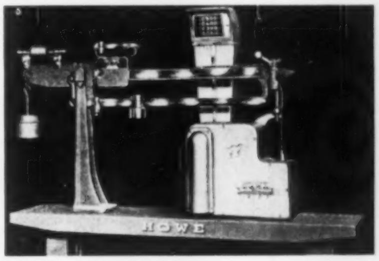


Throat size is 10 x 4½ inches and stroke is adjustable from 1 to 2 inches. Press may be operated by hand control or an accessory foot control. Designed for bench mounting, the press has an 8 x 10-inch base, stands 30 inches high and weighs 72 pounds.

Makes Old Scales New

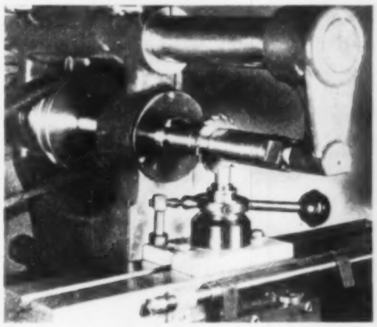
Howe Scale Co., Rutland, Vt., introduces the Howe 77 Weightograph. A weighing accessory, the unit can be attached to any make of beam scale or to any scale convertible to beam operation, making an old-fashioned beam scale an automatic of the latest type. Device is attached to the beam shelf and connected to the beam with a rod. It features a nonprotruding periscope with a eye-level screen which instantly flashes the weight in illuminated figures for rapid reading. Figures may be read at a distance of 15 feet.

Upward pull of the connecting rod swings the chart in an arc, between a stationary light and magnifying lens. Figures and graduations on the chart are magnified 40 times their original size and reflected by means of mirrors to the screen of the periscope. Oil dash-pot connected to the chart unit dampens the up and down movements of the beam. Weights can be added to the counterpoise in order to increase the weighing capacity and the unit may be used to prove the balance of a scale.



Versatile Collet Chuck

Simple opening and closing lever action features the Davos collet chuck that permits loading and unloading operation while lathe is in motion. Manufacturer is Stallion Mfg. Co., 2017 N. Halsted St., Chicago 14, Ill. Any type spindle stop in lathe can be used with this chuck and collet will not move from permanent gripping action when in open position due to a permanent stop.



Unit is also adaptable to use in drill presses, milling machines or grinders. Using standard round, square, hex and plain-serrated type draw collets, chuck is machined from alloy steel, hardened and precision ground to insure accuracy of operation.

Floor Space Saved

Industrial truck designed by the Automatic Transportation Co., 149 W. 87th St., Chicago, Ill., permits operation in limited areas and allows narrower aisles. Transtacker is almost 10 inches shorter than previous models. Protection of all operating parts by a cast drive housing is featured. Steel battery enclosure with doors and drop pin lock allow quick battery changes and provides protection from bumping. Placement of the lifting mechanism on the power head instead of the uprights provides better visibility for the operator.

MATIC
Transtrac

Truck is available in 4000 and 5000-pound capacities. Lift is 70 inches and mast height is 83 inches. Center of gravity is now located lower and forward, closer to the drive wheels providing better traction. Controls work with the handle in the upright position allowing the use of the stacker in cramped quarters.

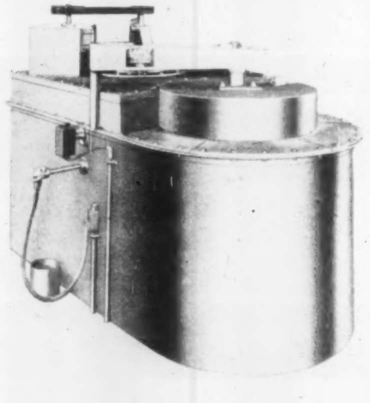
Portable Boring Machine

Horizontal hydraulic boring machines which meet work tolerances to plus or minus 0.0003-inch and finishes to "aircraft" specifications are marketed by Hydro-Borer Co., 1511 W. Florence, Inglewood, Calif. Boring capacity of these machine is ⅝ to 6½ inches diameter and portability is emphasized in that the models weigh only 200 to 300 pounds. Features of these models are: Work is stationary and only boring tool revolves, workholding fixtures can be mounted on the face of the machine. Spindle drive is provided by a ½-hp motor with V-belt drive to multiple pulleys which provide shaft speeds of 460, 900 or 1400 rpm. Maximum feed is predetermined by lead and depth of thread on piston and is fixed at 0.004-inch although lesser feed can be obtained by controlling the by-pass valve.

Machine can be set to feed continuously in a cycling operation, requiring only loading of the parts by the operator. Stops can be precision set anywhere within working tolerances. Model A measures 39 x 27 x 32 inches and weighs approximately 300 pounds. Model C measures 39 x 27 x 14 inches overall and weighs approximately 200 pounds.

Floor Space Saved

Development of a pit-type heat treating furnace is announced by Lanly Co., 750 Prospect Ave., Cleveland 15, O. Furnace is 3½ feet wide, 6½ feet long and stands 5 feet high with a working level of 2½ feet. It can be heated by gas, oil or electricity and provides temperatures ranging from 300 to 1250° F.



Furnace is available in many basket sizes, circular or rectangular. Simplified loading and unloading is accomplished from the top of the furnace. Motor-driven fans circulate air at high velocity to reduce time required to bring furnace up to temperature and also provide uniform temperatures throughout the work chamber.

Crane Saves Time

Wayne Crane Division of American Steel Dredge Co. Inc., Ft. Wayne, Ind., has begun production of the model 20 yard crane. It will travel, lift, swing and boom simultaneously or independently. Subassemblies in the upperworks can be removed separately with a saving of downtime by eliminating major dismantling operation.

Full 360-degree operation over 7 foot 8-inch wheelbase and short turning radius facilitates operation in small areas. It is easily convertible to all front-end attachments. A single engine, gasoline or diesel, supplies both motive and operating power.

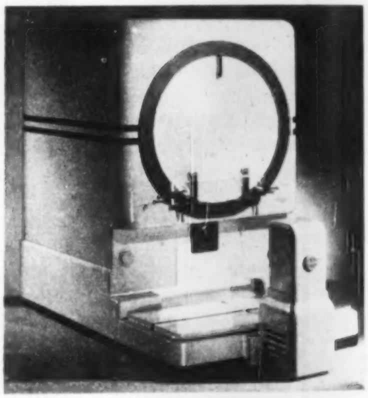
Extra Drilling Speed

Cummins Portable Tools, division of Cummins-Chicago Corp., 4720 N. Ravenswood Ave., Chicago 40, Ill. introduces a ½-inch drill model 225. Equipped throughout with antifriction bearings, it is designed for severe service in factories, garages and major construction operations. Specifications include a 115 v universal motor with ball and roller bearings. Drill is 13⅝ inches long and weighs 8½ pounds.

Permits Visual Checking

Projector designed to introduce optical gaging methods into production inspection is available from Eastman Kodak Co., Rochester 4, N. Y. Model 3 contour projector reflects an enlarged shadow or surface reflection of an object in its staging field onto an illuminated screen. This reflection permits instant visual checking of the part against drawings or other specifications data previously placed over the viewing screen.

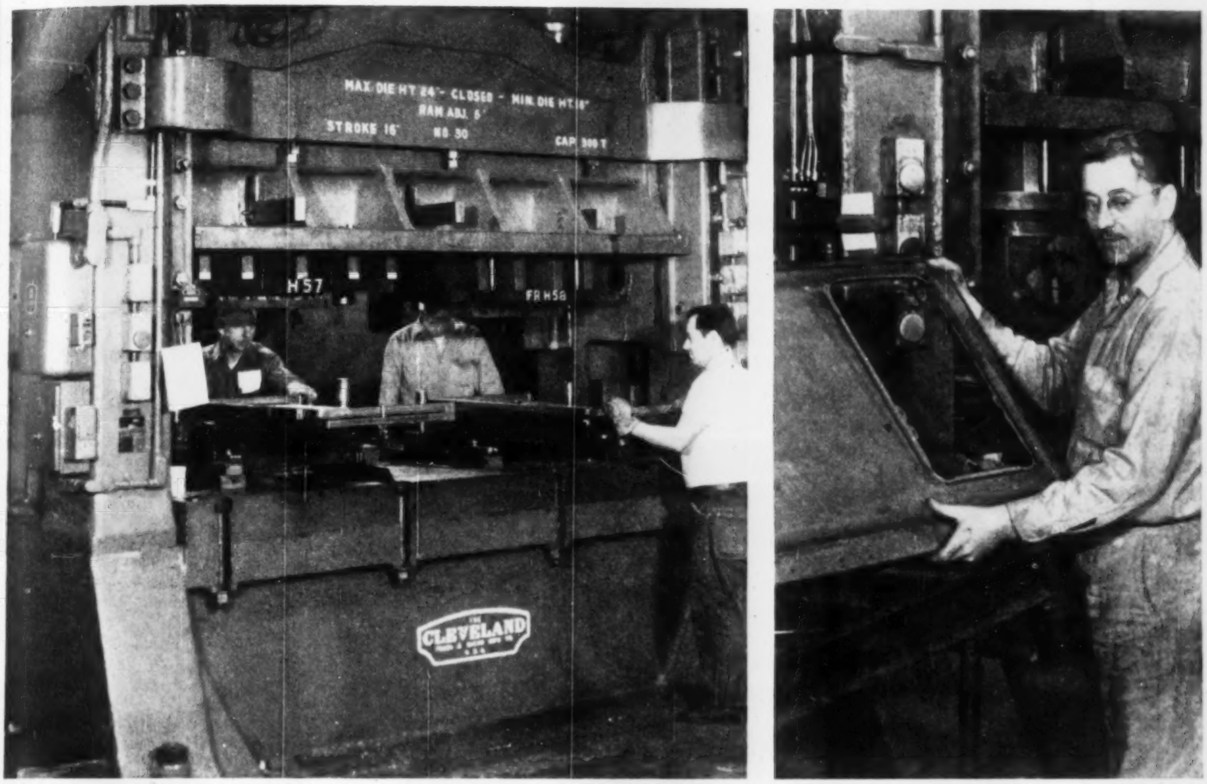
Reduction of over-all size of the unit and use of an optical system which allows constant 8-inch focal distance for all magnifications up to 100X makes projector adaptable to production line inspection. Model 3 has an accessory by which light can be sent out of the same lens that picks up the image so that surfaces and deep recesses which cannot be shadow-projected may be examined.



Clamp Handles Shells

Clamp for handling artillery shells is a new attachment for fork trucks developed by Baker Industrial Truck Division, Baker-Raulang Co., 1250 W. 80th St., Cleveland 2, O. The device grasps, lifts and rotates individual

Grand way to cut range production costs



Progressive dies blanking and forming main top of Grand Range.

OUR new Cleveland Double Crank Press enables us to form every stamping used in Grand gas ranges—right here in our own plant. Wide bed area and exceptional clearance of the slide, when open, allowed us to redesign our dies for more economical operation," stated Mr. E. F. Kennedy, superintendent of Grand Home Appliance Division, Grand Industries, Inc. "Furthermore, our production can be readily stepped up by using two or even three progressive dies in this press at the same time. We expect further production economies, for we will be able to stamp several parts that are now fabricated. Our new Cleveland is helping to make Grand gas ranges a better product while at the same time cutting our production costs."

You, too, can realize similar savings in your production costs. Cleveland engineers have wide experience in all phases of the metal stamping industry. Why not call in a Cleveland engineer to study your production . . . find out how Cleveland Presses can reduce your production costs. Contact us today . . . no obligation.

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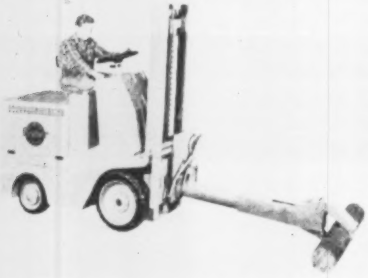
FABRICATING TOOLS

CLEVELAND 14, OHIO

shells and places them in presses, furnaces, racks or in any other place where they may be needed. Attachment is easily removable so that it can be used interchangeably with standard pallet forks.

Clamp consists of a rotating device with a ram 60 inches long. Hydraulic clamp is located at the outer end and provides 2 inches to 12 inches clamp action to handle 4 to 10-inch diameter cylinders weighing up to a maximum of 500 pounds. A 90 degree rotation is provided so that shells may be placed in a vertical or horizontal position.

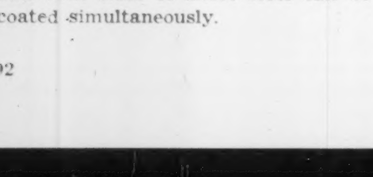


Variable Speed Pulley

Gerbing Mfg. Corp., 11801 Milwaukee Ave., Northbrook, Ill., offers variable speed changes in the 15-hp range with a 3 to 1 ratio variable pitch pulley. Known as the Roto-Cone model 1300-150, pulley uses a standard vari-speed rubber V-belt. Rack and gear arrangement controls sheave movement and provides belt alignment throughout speed range. Longer belt life and smooth vibrationless drive are claims for this model. Variable speed pulleys are available from fractional sizes to 15-hp models.

Conveyor Coats Metal Parts

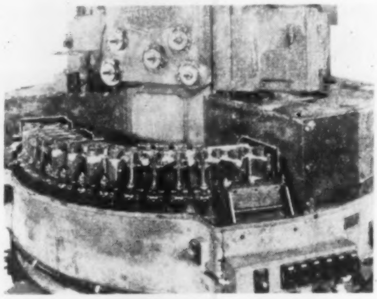
Conveyor which coats and dries applications to metal parts is manufactured by the Klass Machine & Mfg. Co., 4327 E. 49th St., Cleveland 25, O. Metal sheets are pulled by power on a large steel roller. Device applies the coating at the start of the conveyor and both sides of sheet steel can be coated simultaneously.



As the coated material moves down the conveyor a series of infra-red lamps dries the coating. Entire cycle is automatic. Framework is structural steel and conveyor is 20 feet long, 4 feet wide and 3 feet high. Other sizes are available and the unit can also be adapted to handle flat parts.

Connecting Rods Finished

Mattison Machine Works, Rockford, Ill., announces a No. 100C five head rotary automatic surface grinder for finishing the sides of connecting rods and connecting rod caps. Workpieces are held in automatic clamping fixtures. One revolution of the table under the grinding heads finishes one side.



Each of the two parts are then turned over into next fixture station for grinding the other side. Automatic sizers are constantly in operation checking the work and keeping all the pieces within the specified tolerances without the operator's attention.

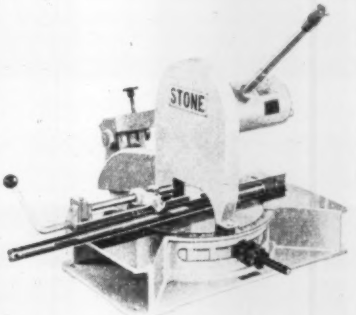
Front-Dump Truck

Kalamazoo Mfg. Co., Kalamazoo, Mich., announces addition of a dump control on the front end gate of their Kal-Truck, a 2/3-cubic-yard or 3000-pound hauler. Control door allows pouring into small or narrow openings and permits discharging partial loads.

Dump control is manually operated and may be opened or closed at any time. Additional feature of this control is that installation of a front end gate embodying dumping device can be installed on trucks already in service.

Reduces Cutting Costs

Machine that performs cutting of ferrous and nonferrous metals at the rate of 4 seconds per square inch is now in production at Stone Machinery Co. Inc., 649 Fayette St., Manlius, N. Y. Capacity of model M-14, is 1½ inches for solids, 2½ inches for pipe and structurals and miscellaneous cutting of 2-inch solids for 15 seconds.



Device features positive drive without the use of belts and uses a 3½-hp motor. Cutter swivels up to 45 degrees in either direction and requires a minimum bench space of 34 x 32 inches.

Masking Tapes

Under the tradename of Behr-Cat brand, a new line of paper-backed, pressure-sensitive tapes is introduced by Behr-Manning Corp., Troy, N. Y. Applications include use in spray or brush painting, stencilling; packaging for shipment or storage; sealing against dust; holding loose parts in assembly; labeling and surface protection.

Speed Selector

Speed-Juster, a new hand lever control that fits most 15 or 20-inch drill presses and other variable speed applications, is made by Savage Mfg. Co., Phoenix, Ariz. It enables speed changes to be made while machine is in operation. There are no dead spots in speed range and any desired speed can be obtained.

Power Boiler Conditioner

Agava Products Inc., Jersey City, N. J., announces a power boiler conditioner, a safe colloidal organic compound that is prepared to act as a rust and corrosion preventive besides

When Finish
is Important...
NORTON
ABRASIVES

Specify ALUNDUM Polishing Abrasive

. . . **the abrasive** that will do the job quickly and economically.

- For fast cut on roughing operations — specify S-treated ALUNDUM abrasive
- For a general purpose abrasive for roughing or finishing, where long life is of primary importance, and for jobs where the wheel is set-up with cement—specify B-Treated ALUNDUM abrasive
- For finishing operations, where glue is used as the adhesive—specify R-Treated ALUNDUM abrasive

For full details on ALUNDUM Polishing Abrasive, and many helpful polishing tips, write for your free copy of, "Setting up Metal Polishing Wheels and Belts."

NORTON COMPANY, Worcester 6, Mass.
Distributors In All Principal Cities
G-223

Making better products to make other products better

removing scale, impurities and oils from boilers. Old scale is disintegrated and can be removed by draining; heat preventing oils which may be present in the heating system are held in solution and not permitted to adhere to boiler and piping surfaces.

Counterbores, Step Drills

Small counterbores and step drills made from carbon high speed steel or special steel alloy are available from Woodruff & Stokes Co. Inc., Hingham, Mass. They have a tolerance of 0.0002-inch on diameter and 0.0003-inch on eccentricity.

Thermostat for Immersion Use

Designated as C4371, a new thermostat for immersion where external surface temperatures do not follow closely enough is announced by Spencer Thermostat, division of Metals & Controls Corp., Attleboro, Mass. Temperature settings are factory preset to temperature desired and are not adjustable. Differential between opening and closing temperatures may be from 15° F and up.

Double Operated Valve

DDS-4-375, a new corrosion resistant double operated solenoid valve for air and low pressure hydraulic cylinders is available from Airmatic Valve Inc., Cleveland, O. It is for use where pressure must be held on one side of the cylinder for a given period of time. This model is made in ¼, ⅜ and ½-inch full orifice area in two styles of mounting.

Chrome Plating Anode

Hanson-Van Winkle-Munning Co., Matawan, N. J., has developed Chrome-Flo, a chrome plating anode. It's qualities include insoluble chromate film formation on anodes decreased with use of special alloy lead type S; open construction makes higher current densities possible; decreased weight of the anode; better covering power due to wider density range.

Produces Demineralized Water

Enley Products Inc., New York 7, N. Y., announces the Demon which produces deminerilized chemically pure water. It utilizes a replaceable plastic cartridge the resins in which change color from blue to yellow as they become exhausted. The tubing is attached to the water tap. As water passes through, metallic and other ionic solids are removed from solution by mixture of anion and cation exchangers.

Compiles, Plots Automatically

Brown Electronik function plotter, offered by Minneapolis-Honeywell Regulator Co., Philadelphia 44, Pa., incorporates two measuring systems, one which actuates the recorder pen while the other motivates the instrument chart. This makes it possible for the device to automatically comply two measurements and plot a curve to show their interrelationship.

Flow Interlock

An improved flow interlock, a device that responds to a flow of water to open or close an electrical contact, is announced by General Electric's Control Divisions, Schenectady 5, N.Y. New de-union fittings at both ends, a bronze piston, reduced size and weight, simpler adjustment and more wiring space are features of the device.

Horizontal Circulators

Taco Heaters Inc., Providence 3, R. I., offer 3-inch horizontal circulators for use with equipment requiring volumes of air within their capacities. The drive coupling of synthetic rubber isolates the motor from impeller for vibrationless operation. Unit is oil lubricated at two points on motor and large oil reservoir is packed with wool waste for impeller shaft.

Soldering Rings for Brazing

Flat wire No-Tangle notched coil stress relieved silver brazing and soldering rings for improved brazing are available from Lucas-Milhaupt Engineering Co., Cudahy, Wis. These preforms were designed for applications requiring larger volume of silver alloy for added strength in critical joints and where depth and shape of groove prohibit use of round wire rings.

Increases Load Travel

To increase load travel of their utility hoist from 77½ to 97½ inches, Unit Mfg. Co., Minneapolis 3, Minn., offers a 12-inch boom extension. A new sheave attachment is said to increase load travel an additional 25 per cent.

Free Wheeling Tractor

Calabar Corp., South Gate, Calif., has incorporated free wheeling into their fluid tractor. This feature consists of a magnetically operated clutch which engages the drive wheel when the power is on and disengages, allowing tractor to roll freely, when power is off. Therefore, a tractor propelled load can be quickly hand spotted without jogging and on mating conveyor lines tractor with subassembly can freely follow movement of main conveyor line. Tractor is available with either ½ or ¾-hp, 3-phase electric motor operating at 1750 rpm. It fits any track with flat or tapered tread from 2 inches minimum to 6¼ inches maximum.

Drawing Compound

No. 527, a compound blended for deep drawing of a wide variety of grades of steel and thicknesses of steel of many types is introduced by Pillsbury Chemicals, Detroit 11, Mich. It also draws aluminum. It is nonpigmented and water soluble and can be mixed to any consistency quickly.

Zinc Chromate Primer

Metyl-Mate, a red oxide chromate primer, made by John W. Masury & Son Inc., Baltimore 30, Md., is for use on ornamental iron and steel fabricating. It air dries hard over night and can be baked if desired. It may be applied by brush or spray.

Wide Opening Jaws

Two new additions have been made to the Lubring line of self-lubricating pliers, available from Utica Drop Forge & Tool Corp., Utica, N. Y. They are 6-inch diagonal cutting pliers, No. 241 and 6-inch diagonal cutting pliers No. 242SW with a wire stripping hole in the blade and sleeve grooves or wire twisters with W-shaped stripping notches on back of the head. A ring of porous, oil bearing iron which rides in the joint lubricates pliers as they are used.

Internal Thread Comparator

An internal thread comparator developed by Rimat Machine Tool Co., Glendale 1, Calif., measures from the pitch line of any one thread in a nut to the pitch line of the two threads lying diametrically opposite it. When set to a basic ring gage, the device gives plus or minus deviations from the basic pitch. Indicator reading is in tens of thousandths and for any one setting, it has range of plus or minus 0.003-inch.

FOR MORE INFORMATION

on the new products and equipment in this section write to Readers' Service Dept., STEEL, Penton Bldg., Cleveland 13, O. It will receive prompt attention.

The Market Outlook

STEEL production is booming along at record pace. But output falls far short of meeting demands, as defense load on the mills is mounting steadily. Procurement problems of civilian goods manufacturers are intensifying as more and more tonnage is diverted to government work. And the end is not in sight. Further cutbacks in steel use in consumer goods are planned for third quarter, probably to 70 per cent of the tonnage used in such items in the average quarter of the first half of 1950. Currently, use is held to 80 per cent.

OUTLOOK— There is little prospect for any improvement in supply conditions for months to come even after the Controlled Materials Plan goes into effect July 1. It will take some months for this distributing system to get into smooth operation, and, even then, it will apply only to defense and defense-support consumption, unrated consumers being left on their own to pick up supplies wherever and whenever they can.

DIRECTIVES— Recent amendment to the maintenance and repair regulation has resulted in cancellation of some DO-97 rated orders by the mills. Orders for repairs to plants and machinery, and recognition of DO-99 rated orders from warehouses still stand among the more important MRO commitments, but numerous contracts are nullified by the revision in the regulation. As a result, consumers affected by the change will have to rely on "free" tonnage for their needs, at least for the present.

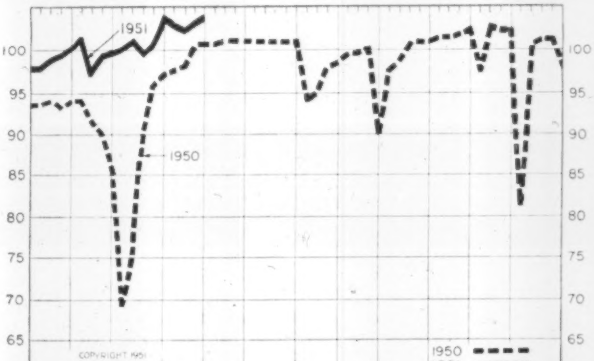
PRODUCTS— Structural fabricators are shunning unrated work, with severe cuts in steel allotments scheduled for June and delivery promises on unrated tonnage extending far into the future. So extended are deliveries considerable building is being postponed indefinitely. The government is reported getting ready to allocate virtually all of the nation's structural steel which will mean that many 1951 building plans not directly related to the defense effort will probably be postponed for at least a year. Consumers also are showing increasing concern over plate supplies with the mills booked into August on rated orders. Sheet demand exceeds supply, but pressure for this product is less strong than for plates, bars and structurals.

RAW MATERIALS— Nonintegrated steel mills and foundries are feeling the further shrinkage in pig iron supply. Greater dependence is being placed on scrap and ferroalloys in foundry melts. However, scrap supply is anything but plentiful and a growing stringency in ferroalloys is developing. Cutbacks in some foundry operations due to shortages of pig iron, coke and scrap are reported. Fear is rising some open hearths soon may be forced onto the idle list for lack of scrap. One open hearth at an eastern plant was taken off last week and it is understood only direct government allocation of scrap is preventing shutdown of melting facilities at several other points. Last week the government allocated 45,000 to 50,000 tons of melting scrap to Youngstown district mills. This scrap is coming out of the Chicago area and gives rise to fears of shortage at that point.

OPERATIONS— National ingot rate went up ½ point last week to 103.5 per cent of capacity. This is equivalent to production of 2,069,000 net tons, and approximates the tonnage produced in the week ended Mar. 31 this year. In first quarter, operations averaged 99.8 per cent. Indications are this mark will be substantially bettered in the current quarter.

PRICES— Firmly established under the government's freeze of last January, steel and related prices are holding unchanged. The general manufacturers price order, just issued by OPS to become effective May 28, does not apply to the basic metals though some fabricated products may be included in its scope. STEEL's weighted index on finished steel is unchanged at 171.92 as is the arithmetical price average at $106.32.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Apr. 28	Change	Same Week 1950	Same Week 1949
Pittsburgh	101.5	— 0.5	104	98
Chicago	108	— 1*	105.5	99
Mid-Atlantic	101	+ 0.5	95	93
Youngstown	104	+ 2	106	105
Wheeling	97.5	+ 0.5	102.5	92
Cleveland	100	3.5*	97	101
Buffalo	104	0	104	101.5
Birmingham	100	0	100	100
New England	90	— 1	88	77
Cincinnati	105	0	106	106
St. Louis	97	+ 2	77.5	80
Detroit	106	0	102	108
Western	107	+ 6.5	94	93.5
Estimated national rate	103.5	+ 0.5	100.5	98

Based on weekly steelmaking capacity of 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950; 1,843,516 tons for 1949.

* Change from revised rate for preceding week.

Composite Market Averages

	Apr. 26 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	171.92	171.92	171.92	156.13	111.62
Index in cents per lb.	4.657	4.657	4.657	4.230	3.024
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$106.32	$106.32	$106.32	$93.18	$63.54
No. 2 Fdry, Pig Iron, GT	52.54	52.54	52.54	46.47	26.17
Basic Pig Iron, GT	52.16	52.16	52.16	45.97	25.50
Malleable Pig Iron, GT	53.27	53.27	53.27	47.27	26.79
Steelmaking Scrap, GT	44.00	44.00	44.00	30.17	19.17

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1985-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Apr. 26 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.45	2.50
Bars, H.R., Chicago	3.70	3.70	3.70	3.45	2.50
Bars, H.R., del. Philadelphia	4.20	4.20	4.18	3.93	2.82
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.10-15	3.10
Shapes, Std., Pittsburgh	3.65	3.65	3.65	3.40	2.35
Shapes, Std., Chicago	3.65	3.65	3.65	3.40	2.35
Shapes, del. Philadelphia	3.91	3.91	3.90	3.46	2.465
Plates, Pittsburgh	3.70	3.70	3.70	3.50	2.50
Plates, Chicago	3.70	3.70	3.70	3.50	2.50
Plates, Coatesville, Pa.	4.15	4.15	4.15	3.60	2.50
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.50	2.50
Plates, Claymont, Del.	4.15	4.15	4.15	3.60	2.50
Sheets, H.R., Pittsburgh	3.60-75	3.60-75	3.60-75	3.35	2.425
Sheets, H.R., Chicago	3.60	3.60	3.60	3.35	2.425
Sheets, C.R., Pittsburgh	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Chicago	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Detroit	4.55	4.55	4.55	4.30	3.375
Sheets, Galv., Pittsburgh	4.80	4.80	4.80	4.40	4.05
Strip, H.R., Pittsburgh	3.75-4.00	3.75-4.00	3.75-4.00	3.25	2.35
Strip, H.R., Chicago	3.50	3.50	3.50	3.25	2.35
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.15	3.05
Strip, C.R., Chicago	4.90	4.90	4.90	4.30	3.15
Strip, C.R., Detroit	4.35-5.60	4.35-5.60	4.35-5.60	4.35-40	3.15
Wire, Basic, Pittsburgh	4.85-5.10	4.85-5.10	4.85-5.10	4.50	3.05
Nails, Wire, Pittsburgh	5.90-6.20	5.90-6.20	5.90-6.20	5.30	3.25
Tin plate, box, Pittsburgh	$8.70	$8.70	$8.70	$7.50	$5.25

SEMIFINISHED

	Apr. 26 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$63.00	$47.00
Wire rods, 7/32-⅝", Pitts.	4.10-30	4.10-30	4.10-30	3.85	2.30

PIG IRON, Gross Ton

	Apr. 26 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$53.00	$53.00	$53.00	$47.00	$27.00
Basic, Valley	52.00	52.00	52.00	46.00	26.00
Basic, del. Phila.	56.49	56.49	56.39	49.44	27.84
No. 2 Fdry, Pitts.	52.50	52.50	52.50	46.50	26.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	46.50	26.50
No. 2 Fdry, Valley	52.50	52.50	52.50	46.50	26.50
No. 2 Fdry, Del. Phila.	56.99	56.99	56.89	49.94	28.34
No. 2 Fdry, Birm.	48.88	48.88	48.88	42.38	22.88
No. 2 Fdry (Birm.) del. Cin.	55.33	55.33	55.58	49.08	26.94
Malleable Valley	52.50	52.50	52.50	46.50	26.50
Malleable, Chicago	52.50	52.50	52.50	46.50	26.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	60.00	33.00
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

	Apr. 26 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
No. 1 Heavy Melt. Pitts.	$45.00	$45.00	$45.00	$34.00	$20.00
No. 1 Heavy Melt. E. Pa.	43.50	43.50	43.50	27.00	18.75
No. 1 Heavy Melt. Chicago	43.50	43.50	43.50	29.50	18.75
No. 1 Heavy Melt. Valley	45.00	45.00	45.00	33.75	20.00
No. 1 Heavy Melt. Cleve.	44.00	44.00	44.00	30.25	19.50
No. 1 Heavy Melt. Buffalo	44.00	44.00	44.00	29.75	19.25
Rails, Rerolling, Chicago	52.50	52.50	52.50	46.50	22.25
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	42.50	20.00

* F.o.b. shipping point.

COKE, Net Ton

	Apr. 26 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Beehive, Furn., Connlsvl.	$14.75	$14.75	$14.75	$14.25	$7.50
Beehive, Fdry., Connlsvl.	17.50	17.50	17.50	16.00	8.25
Oven Fdry., Chicago	21.00	21.00	21.00	21.00	13.00

NONFERROUS METALS

	Apr. 26 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Copper, del. Conn.	24.50	24.50	24.50	19.50	12.00
Zinc, E. St. Louis	17.50	17.50	17.50	11.00	8.25
Lead, St. Louis	16.80	16.80	16.80	10.80	6.35
Tin, New York	142.00	142.00	134.00	76.75	52.00
Aluminum, del.	19.00	19.00	19.00	17.00	15.00
Antimony, Laredo, Tex.	42.00	42.00	42.00	24.50	14.50
Nickel, refinery, duty paid	50.50	50.50	50.50	40.00	35.00

Pig Iron

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N.Y., del.	....	58.96	59.46	....
Newark, del.	56.74	57.24	57.74	58.24
Philadelphia, del.	56.49	56.99	57.49	57.99
Birmingham District				
AlabamaCity, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.33	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y. W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y. T9	....	52.50	53.00	....
Boston, del.	61.63	62.13	62.63	....
Rochester, N.Y., del.	54.74	55.24	55.74	....
Syracuse, N.Y., del.	55.72	56.22	56.72	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
IndianaHarbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill. Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	53.97	54.47	54.47	54.97
Muskegon, Mich., del.	....	58.20	58.20	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, del. from Cleve.	54.49	54.99	54.99	55.49
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	51.75	52.25	....
Fontana, Calif. K1	58.00	58.50	....	....
Geneva, Utah G1	52.00	52.50	....	....
Seattle, Tacoma, Wash., del.	....	60.35	....	....
Portland, Oreg., del.	....	60.35	....	....
LosAngeles, SanFrancisco, del.	59.85	60.35	....	....
GraniteCity, Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.66	55.16	55.66	....
Ironton, Utah C11	52.00	52.50	....	....
LoneStar, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
NevilleIsland, Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.74	53.74	54.24
McKeesRocks, del.	....	53.49	53.49	53.99
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.00	54.00	54.50
Verona, del.	....	54.48	54.48	54.98
Brackenridge, del.	....	54.72	54.72	55.22
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.21	57.71	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.43	56.93	56.93	57.43

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

NiagaraFalls, N.Y. P15	$83.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia delivered	63.12
Troy, N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Apr. 26, 1951; cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)

Fontana,Calif. K1	$79.00
Munhall,Pa. U5	52.00

INGOTS, Alloy (NT)

Detroit R7	$54.00
Fontana,Calif. K1	80.00
Houston,Tex. S5	62.00
Midland,Pa. C18	54.00
Munhall,Pa. U5	54.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)

Bessemer,Pa. U5	$56.00
Clairton,Pa. U5	56.00
Ensley,Ala. T2	56.00
Fairfiedl,Ala. T2	56.00
Fontana,Calif. K1	75.00
Gary,Ind. U5	56.00
Johnstown,Pa. B2	56.00
Lackawanna,N.Y. B2	56.00
Munhall,Pa. U5	56.00
So.Chicago,Ill. U5	56.00
So.Duquesne,Pa. U5	56.00

Carbon, Forging (NT)

Bessemer,Pa. U5	$66.00
Buffalo R2	66.00
Canton,O. R2	66.00
Clairton,Pa. U5	66.00
Cleveland R2	66.00
Conshohocken,Pa. A3	73.00
Detroit R7	69.00
Ensley,Ala. T2	66.00
Fairfield,Ala. T2	66.00
Fontana,Calif. K1	85.00
Gary,Ind. U5	66.00
Geneva,Utah G1	66.00
Houston,Tex. S5	74.00
Johnstown,Pa. B2	66.00
Lackawanna,N.Y. B2	66.00
LosAngeles B3	85.00
Munhall,Pa. U5	66.00
Seattle B3	85.00
So.Chicago R2, U5, W14	66.00
So.Duquesne,Pa. U5	66.00
So.SanFrancisco B3	85.00

Alloy, Forging (NT)

Bethlehem,Pa. B2	$70.00
Buffalo R2	70.00
Canton,O. R2	70.00
Canton,O (29) T7	66.00
Conshohocken,Pa. A3	77.00
Detroit R7	73.00
Fontana,Calif. K1	89.00
Gary,Ind. U5	70.00
Houston,Tex. S5	78.00
Ind.Harbor,Ind. Y1	70.00
Johnstown,Pa. B2	70.00
Lackawanna,N.Y. B2	70.00
LosAngeles B3	90.00
Massillon,O. R2	70.00
Midland,Pa. C18	70.00
Munhall,Pa. U5	70.00
So.Chicago R2,U5,W14	70.00
So.Duquesne,Pa. U5	70.00
Struthers,O. Y1	70.00
Warren,O. C17	70.00

ROUNDS, SEAMLESS TUBE (NT)

Canton,O. R2	$82.00
Cleveland R2	82.00
Fontana,Calif. K1	103.00
Gary,Ind. U5	82.00
Massillon,O. R2	82.00
So.Chicago,Ill. R2	82.00
So.Duquesne,Pa. U5	82.00

SHEET BARS (NT)

Fontana,Calif. K1	$89.00

SKELP

Aliquippa,Pa. J5	3.45
Munhall,Pa. U5	3.35
Warren,O. R2	3.35
Youngstown R2, U5	3.35

WIRE RODS

AlabamaCity,Ala. R2	4.10
Buffalo W12	4.10
Cleveland A7	4.10
Donora,Pa. A7	4.10
Fairfield,Ala. T2	4.10
Fontana,Calif. K1	4.90
Houston,Tex. S5	4.50
Johnstown,Pa. B2	4.10
Joliet,Ill. A7	4.10
LosAngeles B3	4.90
Minnequa,Colo. C10	4.35
Monessen,Pa. P7	4.30
No.Tonawanda,N.Y.B11	4.10
Pittsburg,Calif. C11	4.75
Portsmouth,O. P12	4.30
Roebling,N.J. R5	4.20
So.Chicago,Ill. R2	4.10
SparrowsPoint,Md. B2	4.20
Sterling,Ill.(1) N15	4.10
Struthers,O. Y1	4.10
Torrance,Calif. C11	4.90
Worcester A7	4.40

PLATES, Wrought Iron

Economy,Pa. B14	8.60

STRUCTURALS

Carbon Steel Stand. Shapes

AlabamaCity,Ala. R2	3.60
Aliquippa,Pa. J5	3.65
Bessemer,Ala. T2	3.65
Bethlehem,Pa. B2	3.70
Clairton,Pa. U5	3.65
Fairfield,Ala. T2	3.65
Fontana,Calif. K1	4.25
Gary,Ind. U5	3.65
Geneva,Utah G1	3.65
Houston,Tex. S5	4.05
Ind.Harbor,Ind. I-2	3.65
Johnstown,Pa. B2	3.70
KansasCity,Mo. S5	4.25
Lackawanna,N.Y. B2	3.70
LosAngeles B3	4.25
Minnequa,Colo. C10	4.10
Munhall,Pa. U5	3.65
Niles,Calif.(22) P1	4.85
Phoenixville,Pa. P4	4.95
Portland,Oreg. O4	4.50
Seattle B3	4.30
So.Chicago,Ill. U5, W14	3.65
So.SanFrancisco B3	4.20
Torrance,Calif. C11	4.25
Weirton,W.Va. W6	3.90

Alloy Stand. Shapes

Clairton,Pa. U5	4.35
Fontana,Calif. K1	5.55
Munhall,Pa. U5	4.35
So.Chicago,Ill. U5	4.35

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5	5.50
Bessemer,Ala. T2	5.50
Bethlehem,Pa.(14) B2	5.50
Clairton,Pa. U5	5.50
Fairfield,Ala. T2	5.50
Fontana,Calif. K1	6.10
Gary,Ind. U5	5.50
Geneva,Utah G1	5.50
Ind.Harbor,Ind. I-2	5.50
Ind.Harbor,Ind. Y1	6.00
Johnstown,Pa. B2	5.50
Lackawanna,N.Y.(14)B2	5.50
LosAngeles B3	6.05
Munhall,Pa. U5	5.50
Seattle B3	6.10
So.Chicago,Ill. U5	5.50
So.SanFrancisco B3	6.00
Struthers,O. Y1	6.00

Wide Flange

Bethlehem,Pa. B2	3.70
Clairton,Pa. U5	3.65
Fontana,Calif. K1	4.65
Lackawanna,N.Y. B2	3.70
Munhall,Pa. U5	3.65
So.Chicago,Ill. U5	3.65

H.S., L.A. Wide Flange

Bethlehem,Pa. B2	5.50
Lackawanna,N.Y. B2	5.50
Munhall,Pa. U5	5.45
So.Chicago,Ill. U5	5.45

SHEET STEEL PILING

Ind.Harbor,Ind. I-2	4.45
Lackawanna,N.Y. B2	4.45
Munhall,Pa. U5	4.45
So.Chicago,Ill. U5	4.45

BEARING PILES

Munhall,Pa. U5	3.65
So.Chicago,Ill. U5	3.65

PLATES.High-Strength Low-Alloy

Aliquippa,Pa. J5	5.65
Bessemer,Ala. T2	5.65
Clairton,Pa. U5	5.65
Cleveland J5, R2	5.65
Conshohocken,Pa. A3	5.90
Fairfield,Ala. T2	5.65
Fontana,Calif.(30) K1	6.25
Gary,Ind. U5	5.65
Geneva,Utah G1	5.65
Ind.Harbor,Ind. I-2	5.65
Ind.Harbor,Ind. Y1	6.15
Johnstown,Pa. B2	5.65
Munhall,Pa. U5	5.65
Pittsburgh J5	5.65
Seattle B3	6.55
Sharon,Pa. S3	5.70
So.Chicago,Ill. U5	5.65
SparrowsPoint,Md. B2	5.65
Warren,O. R2	5.65
Youngstown Y1	6.15

PLATES, Open-Hearth Alloy

Claymont,Del. C22	4.85
Coatesville,Pa. L7	5.25
Conshohocken,Pa. A3	5.05
Fontana,Calif. K1	5.70
Gary,Ind. U5	4.75
Johnstown,Pa. B2	4.75
Munhall,Pa. U5	4.75
Sharon,Pa. S3	5.20
So.Chicago,Ill. U5	4.75
SparrowsPoint,Md. B2	4.75

FLOOR PLATES

Cleveland J5	4.75
Conshohocken,Pa. A3	4.75
Harrisburg,Pa. C5	5.95
Ind.Harbor,Ind. I-2	4.75
Munhall,Pa. U5	4.75
So.Chicago,Ill. U5	4.75

PLATES, Carbon Steel

AlabamaCity,Ala. R2	3.70
Aliquippa,Pa. J5	3.70
Ashland,Ky(15) A10	3.70
Bessemer,Ala. T2	3.70
Clairton,Pa. U5	3.70
Claymont,Del. C22	4.15
Cleveland J5, R2	3.70
Coatesville,Pa. L7	4.15
Conshohocken,Pa. A3	4.15
Fairfield,Ala. T2	3.70
Fontana,Calif.(30) K1	4.30
Gary,Ind. U5	3.70
GraniteCity,Ill. G4	4.40
Geneva,Utah G1	3.70
Harrisburg,Pa. C5	4.95
Houston,Tex. S5	4.10
Ind.Harbor,Ind. I-2, Y1	3.70
Johnstown,Pa. B2	3.70
Lackawanna,N.Y. B2	3.70
Minnequa,Colo. C10	4.50
Munhall,Pa. U5	3.70
Pittsburgh J5	3.70
Seattle B3	4.60
Sharon,Pa. S3	3.95
So.Chicago,Ill. U5, W14	3.70
SparrowsPoint,Md. B2	3.70
Steubenville,O. W10	3.70
Warren,O. R2	3.70
Weirton,W.Va. W6	4.00
Youngstown R2, U5, Y1	3.70

PLATES, Carbon A. R.

Fontana,Calif. K1	5.45
Geneva,Utah G1	4.85

PLATES, Ingot Iron

Ashland,c.l.(15) A10	3.95
Ashland,lcl.(15) A10	4.45
Cleveland,c.l. R2	4.30
Warren,O. c.l. R2	4.30

BARS, Hot-Rolled Carbon

AlabamaCity,Ala. R2	3.70
Aliquippa,Pa. J5	3.70
Alton,Ill(1) L1	3.95
Atlanta,Ga. A11	4.25
Bessemer,Ala. T2	3.70
Buffalo R2	3.70
Canton,O. R2	3.70
Clairton,Pa. U5	3.70
Cleveland R2	3.70
Detroit R7	3.85
Emeryville,Calif. J7	4.45
Fairfield,Ala. T2	3.70
Fontana,Calif. K1	4.40
Gary,Ind. U5	3.70
Houston,Tex. S5	4.10
Ind.Harbor,Ind. I-2, Y1	3.70
Johnstown,Pa. B2	3.70
KansasCity,Mo. S5	4.30
Lackawanna,N.Y. B2	3.70
LosAngeles B3	4.40
Milton,Pa. B6	4.20
Minnequa,Colo. C10	4.15
Niles,Calif. P1	5.05
N.Tonawanda,N.Y. B11	3.70
Pittsburg,Calif. C11	4.40
Pittsburgh J5	3.70
Portland,Oreg. O4	4.65
Seattle B3, N14	4.45
So.Chicago R2, U5, W14	3.70
So.Duquesne,Pa. U5	3.70
So.SanFran.,Cal. B3	4.45
Struthers,O. Y1	3.70
Torrance,Calif. C11	4.40
Weirton,W.Va. W6	3.85
Youngstown R2, U5	3.70

BAR SIZE ANGLES; S. SHAPES

Aliquippa,Pa. J5	3.70
Atlanta A11	4.25
Johnstown,Pa. B2	3.70
Lackawanna,N.Y. B2	3.70
Niles,Calif. P1	5.05
Portland,Oreg. O4	4.65
SanFrancisco S7	4.85

BAR SIZE ANGLES; H.R. CARBON

Bethlehem,Pa. B2	3.90

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2	4.30
Buffalo R2	4.30
Canton,O. R2	4.30
Canton,O.(29) T7	3.95
Clairton,Pa. U5	4.30
Detroit R7	4.45
Ecorse,Mich. G5	4.65
Fontana,Calif. K1	5.35
Gary,Ind. U5	4.30
Houston,Tex. S5	4.70
Ind.Harbor,Ind. I-2, Y1	4.30
Johnstown,Pa. B2	4.30
KansasCity,Mo. S5	4.90
Lackawanna,N.Y. B2	4.30
LosAngeles B3	5.35
Massillon,O. R2	4.30
Midland,Pa. C18	4.30
So.Chicago R2, U5, W14	4.30
So.Duquesne,Pa. U5	4.30
Struthers,O. Y1	4.30
Warren,O. C17	4.30
Youngstown U5	4.30

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5	4.55
Gary,Ind. U5	4.55
Youngstown U5	4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy

Aliquippa,Pa. J5	5.55
Bessemer,Ala. T2	5.55
Bethlehem,Pa. B2	5.55
Clairton,Pa. U5	5.55
Cleveland R2	5.55
Fairfield,Ala. T2	5.55
Fontana,Calif. K1	6.60
Gary,Ind. U5	5.55
Ind.Harbor,Ind. I-2	5.55
IndianaHarbor,Ind. Y1	6.05
Johnstown,Pa. B2	5.55
Lackawanna,N.Y. B2	5.55
LosAngeles B3	6.25
Pittsburgh J5	5.55
Seattle B3	6.30
So.Duquesne,Pa. U5	5.55
So.SanFrancisco B3	6.30
Struthers,O. Y1	6.05
Youngstown U5	5.55

BARS, Cold-Finished Carbon

Ambridge,Pa. W18	4.55
BeaverFalls,Pa.M12,R2	4.55
Buffalo B5	4.60
Camden,N.J. P13	5.00
Carnegie,Pa. C12	4.55
Chicago W18	4.55
Cleveland A7, C20	4.55
Detroit P17	4.70
Donora,Pa. A7	4.55
Elyria,O. W8	4.55
FranklinPark,Ill. N5	4.55
Gary,Ind. R2	4.55
GreenBay,Wis. F7	4.55
Hammond,Ind. L2, M13	4.55
Hartford,Conn. R2	5.10
Harvey,Ill. B5	4.55
LosAngeles R2	6.00
Mansfield,Mass. B5	5.10
Massillon,O. R2, R8	4.55
Monaca,Pa. S17	4.55
Newark,N.J. W18	5.00
Plymouth,Mich. P5	4.80
Pittsburgh J5	4.55
Putnam,Conn. W18	5.10
Readville,Mass. C14	5.10
St.Louis,Mo. M5	4.95
So.Chicago,Ill. W14	4.55
SpringCity,Pa.(5) K3	5.00
Struthers,O. Y1	4.55
Waukegan,Ill. A7	4.55
Youngstown F3, Y1	4.55

BARS, Cold-Finished Alloy

Ambridge,Pa. W18	5.40
BeaverFalls,Pa. M12	5.40
Bethlehem,Pa. B2	5.40
Buffalo B5	5.40
Camden,N.J. P13	5.80
Canton,O. R2	5.40
Canton,O.(29) T7	4.90
Carnegie,Pa. C12	5.40
Chicago W18	5.40
Cleveland A7	5.45
Cleveland C20	5.40
Detroit P17	5.55
Donora,Pa. A7	5.45
Elyria,O. W8	5.40
Gary,Ind. R2	5.40
Hammond,Ind. L2, M13	5.40
Hartford,Conn. R2	5.85
Harvey,Ill. B5	5.40
Lackawanna,N.Y. B2	5.40
Mansfield,Mass. B5	5.85
Massillon,O. R2, R8	5.40
Midland,Pa. C18	5.40
Monaca,Pa. S17	5.40
Newark,N.J. W18	5.75
Plymouth,Mich. P5	5.60
So.Chicago,Ill. R2, W14	5.40
Struthers,O. Y1	5.40
Warren,O. C17	5.40
Waukegan,Ill. A7	5.45
Worcester,Mass. A7	5.75
Youngstown F3, Y1	5.40

RAIL STEEL BARS

ChicagoHts.(3,4)I-2, C2	4.75
Franklin,Pa.(3, 4) F5	4.75
FortWorth,Tex.(26) T4	4.85
Huntngtn,W.Va.(3) W7	5.50
Marion,O.(3) P11	4.75
Moline,Ill.(3) R2	3.80
Tonawanda(3,4) B12	4.75
Williamsport(3) S19	5.00
Williamsport(4) S19	5.10

BARS, Wrought Iron

Dover,N.J.(Staybolt)U1	15.00
Dover,(Eng.Bolt) U1	13.50
Dover(Wrgt.Iron) U1	12.25
Economy,Pa.(S.R.) B14	9.60
Economy,Pa.(D.R.)B14	11.90
Economy(Staybolt)B14	12.20
McK.Rks.(Staybolt) L5	14.50
McK.Rks.(S.R.) L5	9.60
McK.Rks.(D.R.) L5	13.00

BARS, Reinforcing (Fabricators)

AlabamaCity,Ala. R2	3.70
Alton,Ill.(6) L1	3.70
Atlanta A11	4.25
Buffalo R2	3.70
Cleveland R2	3.70
Emeryville,Calif. J7	4.45
Fairfield,Ala. T2	3.70
Fontana,Calif. K1	4.40
Gary,Ind. U5	3.70
Houston,Tex. S5	4.10
Ind.Harbor,Ind. I-2, Y1	3.70
Johnstown,Pa. B2	3.70
KansasCity,Mo. S5	4.30
Lackawanna,N.Y. B2	3.70
LosAngeles B3	4.40
Milton,Pa. B6	4.20
Minnequa,Colo. C10	4.50
Niles,Calif. P1	5.05
Pittsburg,Calif. C11	4.40
Pittsburgh J5	3.70
Portland,Oreg. O4	4.65
SandSprings,Okla. S5	4.60
Seattle B3, N14	4.45
So.Chicago,Ill. R2	3.70
So.Duquesne,Pa. U5	3.70
So.San Francisco B3	4.45
SparrowsPoint,Md. B2	3.70
Struthers,O. Y1	3.70
Torrance,Calif. C11	4.40
Youngstown R2, U5	3.70

BARS, Reinforcing (Fabricated; to Consumers)

Huntington,W.Va. W7	5.50
Johnstown, ¼-1" B2	4.75
LosAngeles B3	5.45
Marion,O. P11	5.00
Seattle B3, N14	5.55
So.SanFrancisco B3	5.45
SparrowsPt. ¼-1" B2	4.75
Williamsport,Pa. S19	5.10

SHEETS, Hot-Rolled Steel (18 gage and heavier)

AlabamaCity,Ala. R2	3.60
Asland,Ky.(8) A10	3.60
Butler,Pa. A10	3.60
Cleveland J5, R2	3.60
Conshohocken,Pa. A3	4.00
Detroit M1	4.40
Ecorse,Mich.(8) G5	3.80
Fairfield,Ala. T2	3.60
Fontana,Calif. K1	4.55
Gary,Ind. U5	3.60
Geneva,Utah G1	3.70
GraniteCity,Ill. G4	4.30
Ind.Harbor,Ind. I-2, Y1	3.60
Irvin,Pa. U5	3.60
Lackawanna,N.Y. B2	3.60
Munhall,Pa. U5	3.60
Niles,O. N12	5.25
Pittsburg,Calif. C11	4.30
Pittsburgh J5	3.60
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.60
SparrowsPoint,Md. B2	3.60
Steubenville,O. W10	3.60
Torrance,Calif. C11	4.30
Warren,O. R2	3.60
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.60

SHEETS, H.R. (19 gage)

AlabamaCity,Ala. R2	4.75
Dover,O. R1	5.65
Ind.Harbor,Ind. I-2	5.40
Mansfield,O. E6	5.65
Niles,O. N12	5.75
Torrance,Calif. C11	5.40

SHEETS, H.R. (14-ga., heavier) High-Strength Low-Alloy

Cleveland J5, R2	5.40
Conshohocken,Pa. A3	5.65
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.40
Fontana,Calif. K1	6.35
Gary,Ind. U5	5.40
Ind.Harbor,Ind. I-2	5.40
IndianaHarbor,Ind. Y1	5.90
Irvin,Pa. U5	5.40
Lackawanna(35) B2	5.40
Pittsburgh J5	5.40
Sharon,Pa. S3	5.40
So.Chicago,Ill. U5	5.40
SparrowsPoint(36) B2	5.40
Warren,O. R2	5.40
Weirton,W.Va. W6	5.75
Yongstown U5	5.40
Youngstown Y1	5.90

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2	6.55
Ecorse,Mich. G5	7.10
Fontana,Calif. K1	7.50
Gary,Ind. U5	6.55
IndianaHarbor,Ind. Y1	7.05
IndianaHarbor,Ind. I-2,	6.55
Irvin,Pa. U5	6.55
Lackawanna(37) B2	6.55
Pittsburgh J5	6.55
SparrowsPoint(38) B2	6.55
Warren,O. R2	6.55
Weirton,W.Va. W6	6.90
Youngstown Y1	7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana, Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10
Torrance,Calif. C11	5.10

BLUED Stock, 29 Ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23)F4	6.85

ROOFING SHORT TERNES (8 lb. coated)

Gary,Ind. U5	9.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEETS, LONG Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

SHEETS, Culvert No. 16

	Cu Alloy	Cu Fe
Ashland A10	5.60	...
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2	5.60	5.85
Gary, U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo C16	6.25	...
MartinsFy.O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt. B2	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TIN PLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary U5	8.45	8.70
Ind.Har, I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.Md. B2	8.55	8.80
Warren R2	8.45	8.70
Weirton W6	8.45	8.70
Yorkville,O. W10	8.45	8.70

BLACK PLATE (Base Box)

Aliquippa J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

STRIP, Hot-Rolled Alloy

Bridgprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10
Midland,Pa. C18	5.85
NewBritn,Conn.(10) S15	5.45
Sharon,Pa. S8	5.85
Youngstown U5	5.50

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill.(1) L1	3.75
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32)B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.00
Minnequa,Colo. C10	4.55
NewBritain(10) S15	4.00
NoTonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFracisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)S15	10.75
Carnegie,Pa. S18	10.60
Cleveland A7	10.00
Dover,O. G6	10.50
Fontana,Calif. K1	11.65
Harrison,N.J. C18	10.60
Midland,Pa. C18	10.60
NewBritn,Conn.(10)S15	10.75
Pawtucket,R.I.(11) N8	10.75
Pawtucket,R.I.(12) N8	11.05
Sharon,Pa. S3	10.60
Worcester,Mass. A7	10.30
Youngstown C8	10.60

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgprt,Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.80
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40)T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	...
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	...
Detroit D2	5.60	6.65	7.25	...	...
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	...
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	...
NewYork W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. N8:					
Cleve.-or-Pitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork, W3	...	...	10.30	12.50	15.35

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

Key to Producers

A1	Acme Steel Co.
A3	Alan Wood Steel Co.
A4	Allegheny Ludlum Steel
A7	American Steel & Wire
A8	Anchor Drawn Steel Co.
A9	Angell Nail & Chaplet
A10	Armco Steel Corp.
A11	Atlantic Steel Co.
A13	American Cladmetals Co.
B1	Babcock & Wilcox Tube
B2	Bethlehem Steel Co.
B3	Beth. Pac. Coast Steel
B4	Blair Strip Steel Co.
B5	Bliss & Laughlin Inc.
B6	Boiardi Steel Corp.
B8	Braeburn Alloy Steel
B11	Buffalo Bolt Co.
B12	Buffalo Steel Co.
B14	A. M. Byers Co.
C1	Calstrip Steel Corp.
C2	Calumet Steel Div., Borg-Warner Corp.
C4	Carpenter Steel Co.
C5	Central Iron & Steel Div. Barium Steel Corp.
C7	Cleve. Cold Rolling Mills
C8	Cold Metal Products Co.
C9	Colonial Steel Co.
C10	Colorado Fuel & Iron
C11	Columbia Steel Co.
C12	Columbia Steel & Shaft.
C13	Columbia Tool Steel Co.
C14	Compressed Steel Shaft.
C16	Continental Steel Corp.
C17	Copperweld Steel Co.
C18	Crucible Steel Co.
C19	Cumberland Steel Co.
C20	Cuyahoga Steel & Wire
C22	Claymont Steel Corp.
D2	Detroit Steel Corp.
D3	Detroit Tube & Steel
D4	Disston & Sons, Henry
D6	Driver Harris Co.
D7	Dickson Weatherproof Nail Co.
E1	Eastern Gas&Fuel Assoc.
E2	Eastern Stainless Steel
E4	Electro Metallurgical Co.
E5	Elliott Bros. Steel Co.
E6	Empire Steel Corp.
F2	Firth Sterling Steel
F3	Fitzsimons Steel Co.
F4	Follansbee Steel Corp.
F5	Franklin Steel Div., Borg-Warner Corp.
F6	Fretz-Moon Tube Co.
F7	Ft. Howard Steel & Wire
G1	Geneva Steel Co.
G2	Globe Iron Co.
G3	Globe Steel Tubes Co.
G4	Granite City Steel Co.
G5	Great Lakes Steel Corp.
G6	Greer Steel Co.
H1	Hanna Furnace Corp.
H4	Heppenstall Co.
I-1	Igoe Bros. Inc.
I-2	Inland Steel Co.
I-3	Interlake Iron Corp.
I-4	Ingersoll Steel Div., Borg-Warner Corp.
J1	Jackson Iron & Steel Co.
J3	Jessop Steel Co.
J4	Johnson Steel & Wire Co.
J5	Jones& Laughlin Steel
J6	Joslyn Mfg. & Supply
J7	Judson Steel Corp.
J8	Jersey Shore Steel Co.
K1	Kaiser Steel Corp.
K2	Keokuk Electro-Metals
K3	Keystone Drawn Steel
K4	Keystone Steel & Wire
L1	Laclede Steel Co.
L2	LaSalle Steel Co.
L3	Latrobe Electric Steel
L5	Lockhart Iron & Steel
L6	Lone Star Steel Co.
L7	Lukens Steel Co.

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky. (8) A10	3.75
Warren,O. R2	4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.25

TIGHT COOPERAGE HOOP

Atlanta A11	4.05
Riverdale,Ill. A1	3.90
Sharon,Pa. S3	4.15
Youngstown U5	3.75

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
AlabamaCity R2	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19)K4	5.70	6.15
Buffalo W12	4.85	...
Cleveland A7	5.70	6.15
Crawfordsville M8	5.95	6.40
Donora A7	5.70	6.15
Duluth A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston,Tex. S5	6.10	6.55
Johnstown B2	5.70	6.15
Joliet,Ill. A7	5.70	6.15
KansasCy,Mo. S5	6.30	6.75
Kokomo C16	5.80	6.05
LosAngeles B3	6.65	...
Minnequa C10	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	...
Pitts.Calif. C11	6.65	6.80
Prtsmth.(18)P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.70	5.95
So.S.Fran. C10	6.65	7.10
Sparrows Pt. B2	5.80	6.25
Sterling,Ill.(1)N15	5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	...
Worcester A7	6.00	6.45

WIRE, 16 gage)	An'ld Stone	Galv. Stone
Aliquippa J5	10.15	12.15
Bartonville(1) K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfrdsvle M8	10.30	12.00
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10	10.40	12.40
Palmer,Mass.W12	10.25	12.15
Pitts.Cal. C11	10.60	12.50
Prtsmth.(18) P12	10.55	12.30
SparrowsPt. B2	10.35	12.25
Waukegan A7	10.25	12.15

ROPE WIRE	(A)	(B)
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Cleveland A7	8.55	8.80
Donora,Pa. A7	8.55	8.80
Fostoria,O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
NewHaven A7	8.85	8.10
Palmer,Mass. W12	8.85	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J. R5	8.85	9.10
SparrowsPt. B2	8.65	8.90
Struthers,O. Y1	8.55	8.80
Trenton,N.J. A7	8.85	9.10
Waukegan,Ill. A7	8.55	8.80
Worcester J4, T6	8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	4.85
Aliquippa,Pa. J5	4.85
Atlanta A11	5.10
Alton,Ill.(1) L1	4.85
Bartonville,Ill.(1) K4	4.85
Buffalo W12	4.85
Chicago W13	5.10
Cleveland A7, C20	4.85
Crawfordsville,Ind. M8	5.10
Donora,Pa. A7	4.85
Duluth,Pa. A7	4.85
Fairfield,Ala. T2	4.85
Fostoria,O.(24) S1	5.35
Houston S5	5.25
Johnstown,Pa. B2	4.85
Joliet,Ill. A7	4.85
KansasCity,Mo. S5	5.45
Kokomo,Ind. C16	4.95
LosAngeles B3	5.80
Minnequa,Colo. C10	5.10
Monessen,Pa. P7	5.10
Newark, 6-8ga. I-1	5.50
No. Tonawanda B11	4.85
Palmer,Mass. W12	5.15
Pittsburg,Calif. C11	5.80
Portsmouth,O. P12	5.25
Rankin, Pa. A7	4.85
So.Chicago,Ill. R2	4.85
So.SanFrancisco C10	5.80
SparrowsPoint,Md. B2	4.95
Sterling,Ill.(1) N15	4.85
Struthers,O. Y1	4.85
Torrance,Calif. C11	5.80
Waukegan,Ill A7	4.85
Worcester,Mass. A7, T6	5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12	6.35
Cleveland A7	5.85
Crawfordsville,Ind. M8	6.20
Detroit D2	6.20
Dover,O. G6	6.20
Fostoria,O. S1	6.00
Kokomo,Ind. C16	5.70
FranklinPark,Ill. T6	6.20
Massillon,O. R8	5.85
Monessen,Pa. P16	5.85
Monessen,Pa. P7	6.10
NewHaven,Conn. D2	6.50
Pawtucket,R.I.(12) N8	6.85
Trenton,N.J. R5	6.15
Worcester A7	6.15
Worcester T6	6.50
Worcester W12	6.65

WIRE, Fine & Weaving(8" Coils)

Bartonville,Ill.(1) K4	8.90
Buffalo W12	8.90
Chicago W13	8.90
Cleveland A7	8.90
Crawfordsville,Ind. M8	8.95
Fostoria,O. S1	8.90
Johnstown,Pa. B2	8.90
Kokomo,Ind. C16	8.90
Monessen,Pa. P16	8.90
Palmer,Mass. W12	9.20
Portsmouth,O. P12	8.90
Roebling,N.J. R5	9.20
Waukegan,Ill A7	8.90
Worcester,Mass. A7, T6	9.20

WIRE, Galv'd ACSR For Cores

Bartonville,Ill. K4	8.50
Monessen,Pa. P16	8.50
Roebling,N.J. R5	8.80
SparrowsPoint,Md. B2	8.60
Johnstown,Pa. B2	8.50

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.90
Monessen,Pa. P16	11.40
Roebling,N.J. R5	11.55

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	6.25
Alton,Ill.(1) L1	6.25
Bartonville,Ill.(1) K4	6.25
Buffalo W12	6.25
Cleveland A7	6.25
Donora,Pa. A7	6.25
Duluth A7	6.25
Fostoria,O. S1	6.25
Johnstown,Pa. B2	6.25
LosAngeles B3	7.20
Milbury,Mass.(12) N6	8.05
Monessen,Pa. P7, P16	6.25
Palmer,Mass. W12	6.55
Pittsburg,Calif. C11	7.20
Roebling,N.J. R5	6.55
Portsmouth,O. P12	6.25
So.Chicago,Ill R2	6.25
So.SanFrancisco C10	6.85
SparrowsPoint,Md. B2	6.35
Struthers,O. Y1	6.25
Trenton,N.J. A7	6.55
Waukegan,Ill. A7	6.25
Worcester A7, T6, W12	6.55
Worcester,Mass. J4	6.75

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.90
Alton,Ill.(1) L1	5.90
Buffalo W12	5.90
Cleveland, A7	5.90
Donora,Pa. A7	5.90
Duluth A7	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Monessen,Pa. P7, P16	5.90
NewHaven,Conn. A7	6.20
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	7.10
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
SparrowsPoint,Md. B2	6.00
Torrance,Calif. C11	7.10
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Worcester,Mass. A7	6.20

WOVEN FENCE, 9-15½ Ga.	Col.
AlabamaCity,Ala. R2	126
Ala.City,Ala.,17-18ga.R2	213
Aliquippa,Pa.9-14½ga.J5	130
Atlanta A11	133
Bartonville,Ill.(19) K4	130
Crawfordsville,Ind. M8	132
Donora,Pa. A7	130
Duluth A7	130
Fairfield,Ala. T2	130
Houston,Tex. S5	138
Johnstown,Pa. B2	130
Johnstown,17ga.,6" B2	204
Johnstown,17ga.,4" B2	207
Joliet,Ill A7	130
KansasCity,Mo. S5	142
Kokomo,Ind. C16	132
Minnequa,Colo. C10	138
Monessen, Pa. P7	135
Pittsburg,Calif. C11	153
Portsmouth,O.(18) P12	137
Rankin,Pa. A7	130
So. Chicago,Ill. R2	126
Sterling,Ill.(1) N15	130

FENCE POSTS	Col.
ChicagoHts.,Ill. C2	140
Duluth A7	125
Franklin,Pa. F5	140
Huntington,W.Va. W7	140
Johnstown,Pa. B2	140
Marion,O. P11	140
Minnequa,Colo. C10	130
Moline,Ill. R2	136
So.Chicago R2	140
Tonawanda B12	140
Williamsport,Pa. S19	150

WIRE, Barbed	Col.
AlabamaCity,Ala. R2	136
Aliquippa,Pa. J5	140
Atlanta A11	143
Bartonville,Ill.(19) K4	143
Crawfordsville M8	145
Donora,Pa. A7	140
Duluth,Minn. A7	140
Fairfield,Ala. T2	140
Houston,Tex. S5	148
Johnstown,Pa. B2	140
Joliet,Ill. A7	140
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142
Minnequa,Colo. C10	146
Monessen,Pa. P7	145
Pittsburg,Calif. C11	160
Portsmouth,O.(18) P12	147
Rankin,Pa. A7	140
So.Chicago,Ill. R2	136
So.SanFran.,Calif. C10	160
SparrowsPoint,Md. B2	142
Sterling,Ill.(1) N15	140

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	123
Atlanta A11	126
Bartonville,Ill.(19) K4	123
Crawfordsville M8	132
Donora,Pa. A7	123
Duluth A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburgh,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	147
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	6.10
Bartonville,Ill.(19) K4	5.95
Crawfordsville,Ind. M8	6.30
Donora,Pa. A7	5.95
Duluth A7	5.95
Johnstown,Pa. B2	5.95
Joliet,Ill. A7	5.95
Kokomo,Ind. C16	6.05
Minnequa,Colo. C10	6.20
Pittsburg,Calif. C11	6.90
Portsmouth,O. P12	6.25
Rankin,Pa. A7	5.95
So.Chicago,Ill. R2	6.10
SparrowsPoint,Md. B2	6.05
Sterling,Ill.(1) N15	5.65
Worcester,Mass. A7	6.25

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$7.35
Wheeling,W.Va. W10	7.15

NAILS & STAPLES, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	118
Aliquippa,Pa.(13) J5	118
Atlanta A11	121
Bartonville,Ill.(19) K4	118
Chicago,Ill. W13	118
Cleveland A9	125
Crawfordsville,Ind. M8	122
Donora,Pa. A7	118
Duluth A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburg,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester,Mass. A7	124

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lebanon,Pa. B2	6.15
Minnequa,Colo. C10	6.15
Pittsburgh J5	6.15
Seattle B3	6.65
So.Chicago,Ill. R2	6.15
Struthers,O. Y1	6.15
Youngstown R2	6.15

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa.(32) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85
Seattle B3	10.10

TIE PLATES

Fairfield,Ala. T2	4.50
Gary,Ind. U5	4.50
Ind.Harbor,Ind I-2	4.50
Lackawanna,N.Y. B2	4.50
Minnequa,Colo. C10	4.50
Pittsburg,Calif. C11	4.65
Seattle B3	4.65
Steelton,Pa. B2	4.50
Torrance,Calif. C11	4.65

JOINT BARS

Bessemer,Pa. U5	4.70
Fairfield,Ala. T2	4.70
Ind.Harbor,Ind. I-2	4.70
Joliet,Ill. U5	4.70
Lackawanna,N.Y. B2	4.70
Minnequa,Colo. C10	4.70
Steelton,Pa. B2	4.70

AXLES

Ind.Harbor,Ind. S18	5.60
Johnstown,Pa. B2	5.60

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	...
Huntington,W.Va. W7	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...	(16)4.00
Lackawanna B2	3.60	3.50	...	4.00
Minnequa,Colo. C10	3.60	3.50	...	4.50
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19	...	...	...	4.75

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	23.00	13.5W,4Cr,3V	140.00
Extra Carbon	27.00	18W,4Cr,2V,9Co	217.50
Spec. Carbon	32.50	19W,4Cr,2V,7Co	217.50
Oil Hardening	35.00	18.25W,4.25Cr,1V,4.75Co	185.50
Cr Hot Wrk	35.00	20.25W,4.25Cr,1.6V,12.25Co	323.00
Hi-Carbon-Cr	63.50	1.5W,4Cr,1V,8.5Mo	78.50
18W,4Cr,1V	123.50	6.4W,4.5Cr,1.9V,5Mo	87.00
18W,4Cr,2V	138.00	6W,4Cr,3V,6Mo	109.50

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M14, S8, U4, V2, V3.

Key to Producers

M1	McLouth Steel Corp.
M4	Mahoning Valley Steel
M5	Medart Co.
M6	Mercer Tube & Mfg. Co.
M8	Mid-States Steel & Wire
M9	Midvale Co.
M12	Moltrup Steel Products
M13	Monarch Steel Co.
M14	McInnes Steel Co.
N2	National Supply Co.
N3	National Tube Co.
N5	Nelsen Steel & Wire Co.
N6	NewEng.HighCarb,Wire
N8	Newman-Crosby Steel
N12	Niles Rolling Mill Co.
N14	Nrthwst. Steel Roll.Mills
N15	Northwestern S.&W.Co.
N16	New Delphos Mfg. Co.
O3	Oliver Iron & Steel Corp.
O4	Oregon Steel Mills
P1	Pacific States Steel Corp.
P2	Pacific Tube Co.
P4	Phoenix Iron & Steel Co.
P5	Pilgrim Drawn Steel
P6	Pittsburgh Coke&Chem.
P7	Pittsburgh Steel Co.
P9	Pittsburgh Tube Co.
P11	Pollak Steel Co.
P12	Portsmouth Division, Detroit Steel Corp.
P13	Precision Drawn Steel
P14	Pitts.Screw & Bolt Co.
P15	Pittsburgh Metallurgical
P16	Page Steel & Wire Div., Amer. Chain & Cable
P17	Plymouth Steel Co.
R1	Reeves Steel & Mfg. Co.
R2	Republic Steel Corp.
R3	Rhode Island Steel Corp.
R5	Roebling's Sons, John A.
R6	Rome Strip Steel Co.
R7	Rotary Electric Steel Co.
R8	RelianceDiv.,EatonMfg.
S1	Seneca Wire & Mfg. Co.
S3	Sharon Steel Corp.
S5	Sheffield Steel Corp.
S6	Shenango Furnace Co.
S7	Simmons Co.
S8	Simonds Saw & Steel Co.
S9	Sloss-Sheffield,S.&I. Co.
S13	Standard Forgings Corp.
S14	Standard Tube Co.
S15	Stanley Works
S16	Struthers Iron & Steel
S17	Superior Drawn Steel Co.
S18	Superior Steel Corp.
S19	Sweet's Steel Co.
S20	Southern States Steel
T2	Tenn. Coal, Iron & R.R.
T3	Tenn. Prod. & Chem.
T4	Texas Steel Co.
T5	Thomas Steel Co.
T6	Thompson Wire Co.
T7	Timken Roller Bearing
T9	Tonawanda Iron Div. Am. Rad. & Stan. San.
U1	Ulster Iron Works
U4	Universal Cyclops Steel
U5	United States Steel Co.
V2	Vanadium-Alloys Steel
V3	Vulcan Crucible Steel Co.
W1	Wallace Barnes Co.
W2	Wallingford Steel Co.
W3	Washburn Wire Co.
W4	Washington Steel Corp.
W6	Weirton Steel Co.
W7	W. Va. Steel & Mfg. Co.
W8	West.Auto.Mach.Screw
W9	Wheatland Tube Co.
W10	Wheeling Steel Corp.
W12	Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13	Wilson Steel & Wire Co.
W14	Wisconsin Steel Div. International Harvester
W15	Woodward Iron Co.
W18	Wyckoff Steel Co.
Y1	Youngstown Sheet & Tube

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(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(23) 28 Ga. 36" wide
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. edge or square edge.
(33) To jobbers, deduct 20 cents.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher

The Metal Market

Supply position of copper and brass mill fabricators deteriorates further with deficiency in copper jumping to nearly 250,000 tons. Chilean copper imports to rise

COPPER AND BRASS mills are losing ground in their efforts to satisfy a large portion of civilian product demand while shipping increasingly large tonnages to defense plants. CMP is not expected to result in any material easing in the pressure on mills.

Copper producers urge NPA officials to take over complete allocation of copper after July 1. They believe allocations of the metal to military and essential users under CMP may leave no copper for less essential civilian purposes. Trade reports that demand for copper is maintaining the same record pace experienced since outbreak of the Korean War are substantiated by NPA's notification that it will ask copper producers to set aside 5 per cent of their May and June output for vital military needs and civilian hardship cases.

More foreign copper may be available to users in this country later this year. An agreement reportedly has been reached with Chile which will give that country a "moderate price increase" on copper shipped to this country. Unofficial estimates are that the increase may be 2½ cents a pound. Final action by Congress suspending the 2-cent import duty was taken last week. This will result in a larger flow of foreign copper.

Directors of Kennecott Copper Corp., New York, have authorized expenditure of $7 million for underground copper mining at Ruth, Nev. The project may cost an additional $6 million before it is completed. Goal of the project is the mining of 8000 tons of 0.83 per cent copper ore daily. Operations at the Ruth open pit will continue. Underground mining is scheduled to start in 28 months after the sinking of the new shaft is completed.

At the end of March, copper and brass mill fabricators had a deficiency of 249,952 tons in their copper supply position. This compared with a deficiency of only 8692 tons at the end of January, 1950. Their unfilled orders have jumped to 306,307 tons while their total stocks and purchases of copper total only 56,355 tons. During March, they received 116,793 tons of copper from producers while shipping products containing 113,963 tons of the metal.

Lead Supply Tightens

If you have been receiving a fairly satisfactory volume of lead from your supplier, this may change rapidly over the coming weeks. DO orders for May shipment are exceptionally heavy and well in excess of the 20 per cent set aside figure as required under M-38.

As pointed out previously, lead sellers have been dependent upon foreign sources for a large portion of their offerings. Imports in the first quarter dropped to only about one-third of the volume for the like period a year ago, reflecting the effect of the increase in the tariff on Jan. 1 and the active demand for metal by European countries.

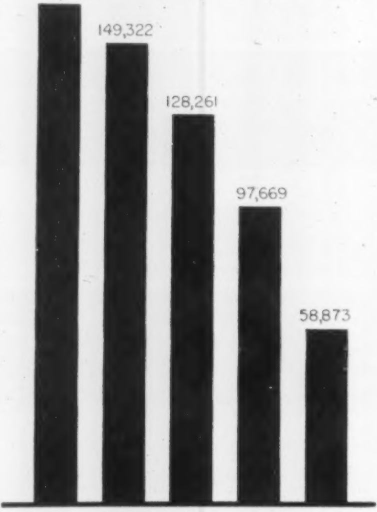
The flow of metal from Mexico may be cut further as a result of labor trouble in that country. The Chihuahua smelter of American Smelting & Refining Co. was forced to close last week as a result of an electric power utilities strike in Mexico. The smelter produces up to 10,000 tons of lead bullion a month. Operations at the company's Monterrey refinery likely will be cut soon if the strike is continued. Operations at other smelteries and refineries in Mexico are adversely affected by a shortage of locomotives.

Straits Tin Holds at $1.42

The government's selling price for Grade A tin held at $1.42 a pound last week through Apr. 26. RFC and Bolivian producers have signed an interim contract for tin concentrates for the three-month period ending May 31. The price will be the average of the New York equivalent of the Singapore price ex-smelter, during the period Apr. 10 to May 31, less 4 cents a pound f.a.s. South American ports. A long-term contract is expected to be signed later in which the price will be based on the average between the New York equivalent of the Singapore price and the New York price, this average to be less the 4 cents a pound f.a.s. South American ports.

Fabricators' Copper Supplies . . . they're slipping

(Monthly Average Per Quarter, Net Tons)



Resumes Tin Mining in South

High price of tin has propelled an Alabama company back into tin mining. The operation, three miles northeast of Rockford, Coosa county, Alabama, is expected to produce about 200 tons of tin annually. It produced on an experimental basis during World War II but was abandoned because it was not deemed profitable at that time.

Revere Expands in Balitmore

Revere Copper & Brass Inc. has begun the erection of a one-story 60,000 square foot addition at its Wicomico street plant in Baltimore. This will about double capacity at that plant for producing aluminum tubing and extruded shapes. Work is expected to be completed next fall. At the company's Canton plant in the Baltimore district, a major enlargement of aluminum rolling mill facilities has been almost completed.

Canada Orders Nickel Rationing

Canada, which produces about 90 per cent of the world's nickel, will undergo compulsory government rationing of this essential metal, starting May 1. Order No. 1, placing nickel under control, was issued by F. V. C. Hewett, metals administrator in the Defense Production Department. No drastic curtailment of nickel to civilian industry is expected. Defense projects in Canada, the United States and Great Britain would get top priority, but it appeared likely sufficient quantities will be available to maintain distribution to some less essential consumers.

Most civilian manufacturers of consumer goods now get about 65 per cent of their 1950 purchases through a voluntary rationing system introduced late last year. These include producers of chrome plate for automobiles and various kitchen and household equipment.

By placing nickel under government control, official scrutiny can be made of manufacturers' stockpiles. The order acts two ways: It bans purchase of primary nickel or electrical resistance alloys containing nickel without a government permit; it bans the sale, supply and delivery of these nickel types without government approval.

The order applies to primary nickel, meaning nickel of any concentration in these forms: Copper nickel shot used for remelting, electrolytic cathodes, ingots and shot. It also applies to electrical resistance alloys, meaning any electrical resistance alloys containing 50 per cent or more of nickel, or nickel and chromium.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c. Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 29.00c; 88-10-2 (No. 215) 44.50c; 80-10-10 (No. 305) 35.00; No. 1 yellow (No. 405) 25.50c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.85c, delivered.

Lead: Common 16.80c; chemical 16.90c; corroding 16.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 30.75-32.50c; No. 12 foundry alloy (No. 2 grade) 30.75-31.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 32.75-33.50c; grade 2, 30.00-31.50c; grade 3, 30.00-30.50c; grade 4, 28.50-30.00c. Prices include freight at c.l. rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 142.00.

Antimony: American 99-99.8% and over but not meeting specifications below 42.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 42.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 50.50c; 25-lb pigs, 53.15c; "XX" nickel shot, 54.15c; "F" nickel shot or ingots, for addition to cast iron, 51.00c. Prices include import duty.

Mercury: Open market, spot, large lots, New York, $216-$220 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.10 per lb for 500 lb (kegs); $2.12 per lb for 100 lb (case); $2.17 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 90.16c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 41.03; yellow brass 37.84; commercial bronze, 95%, 40.99; 90%, 40.55; red brass, 85%, 39.59; 80%, 39.15; best quality, 39.15; nickel silver, 18%, 51.91-52.36; phosphor-bronze grade A, 5%, 60.20-62.82.

Rod: Copper, hot-rolled 36.88; cold-drawn 38.13; yellow brass free cutting, 32.23; commercial bronze, 95%, 40.68; 90%, 40.24; red brass 85%, 39.28; 80%, 38.84.

Seamless Tubing: Copper 41.07; yellow brass 40.85; commercial bronze, 90%, 43.21; red brass, 85% 42.50.

Wire: Yellow brass 38.13; commercial bronze, 95%, 41.28; 90%, 40.84; red brass, 85%, 39.88; 80%, 39.44; best quality brass, 39.44.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67-30.295; l.c.l. 29.17-30.92; 100,000 lb lots 28.545-30.295; weatherproof, f.o.b. eastern mills, c.l. 30.10, l.c.l. 30.18, 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more; but not in excess of rate applicable on 30,000 lb c.l. orders.)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

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* Lenghts 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	Round R317-T4, 17S-T4	Hexagonal R317-T4	Hexagonal 17S-T4
0.125	52.0	...	...
0.156-0.188	44.0	...	...
0.219-0.313	41.5	...	...
0.375	40.0	46.0	48.0
0.406	40.0	...	...
0.438	40.0	46.0	48.0
0.469	40.0	...	...
0.500	40.0	46.0	48.0
0.531	40.0	...	...
0.563	40.0	...	45.0
0.594	40.0	...	...
0.625	40.0	43.5	45.0
0.688	40.0	...	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	...	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	...	...
1.625	36.5	...	39.5
1.688-2.000	36.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $22.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $22.00 per cwt. Traps and bends: List prices plus 60%.

ZINC

Sheets, 24.50c, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-24.50c; over 12-in., 23.50-24.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 71.50c. Strip, cold-rolled, 77.50c. Rods and shapes, 67.50c. Plates, 69.50c. Seamless tubes, 100.50c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 57.00c. Strip, cold-rolled 60.00c. Rods and shapes, 55.00c. Plates, 56.00c. Seamless tubes, 90.00c. Shot and blocks, 50.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 27.00c, 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 37.69c; oval 37.19c, Cast 37.375c, delivered in eastern territory.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 60.8c, under 1000 lb 62.8c, f.o.b Niagara Falls, N. Y.

Sodium Cyanide: 96-98% ½-oz ball, in 200 lb drums, 1 to 900 lb, 19.00c; 1000 to 19,900 lb, 18.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 29.25c; over 200 lb 28.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 68.50c; 10,000 to 30,000 lb, 69.50c; 3000 to 10,000 lb, 70.50c, 500 to 3000 lb 71.50c; 100 to 500 lb, 73.50c; under 100 lb, 76.50c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 35.00c; 400-lb bbl. 33.00c up to 10,000 lb, 32.50c; over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; ball, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers nom.; 100 or 300 lb drums only, 100 to 500 lb, nom.; 600 to 1900 lb, nom.; 2000 to 9900 lb, nom.; f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums, 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb nom.; more than 2000 lb, nom., f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, nom.; 100 lb kegs nom., f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 20,000 lb, f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	23.00	23.00	22.25
Yellow Brass	20.125	19.875	18.75
Commercial Bronze			
95%	21.875	21.625	21.125
90%	21.75	21.50	21.00
Red Brass			
85%	21.50	21.25	20.75
80%	21.375	21.125	20.625
Muntz metal	19.00	18.75	18.25
Nickel, silver, 10%	22.25	22.00	11.125
Phos. bronze, A	24.00	23.75	22.75

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 29.00; No. 2 copper 27.50; light copper 25.00; composition red brass 25.00-25.50; radiators 20.00; heavy yellow brass 19.50.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 21.50*; No. 2 copper 20.00*; light copper 19.00*; refinery brass (60% copper) per dry coper content 20.00.

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* Nominal.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 25.50-26.50; No. 2 24.00-25.00; light copper 22.00-22.50; No. 1 composition red brass 22.00-23.00; No 1 composition turnings 21.00-22.00; mixed brass turnings 13.00; new brass clippings 20.00-21.00; No. 1 brass rod turnings 19.00; light brass 15.00; clean heavy yellow brass 17.50; new brass rod ends 19.50; auto radiators 17.50-18.00; cocks and faucets, 19.00-19.50; brass pipe 20.00-20.50.

Lead: Heavy 16.50-16.75; battery plates 9.50-10.00; linotype and stereotype 17.00; electrotype 15.75-16.00; mixed babbitt 17.00.

Zinc: Old zinc 12.50-13.00; new die cast scrap 12.50-13.00; old die cast scrap 8.25-8.50.

Tin: No. 1 pewter 80.00-85.00; block tin pipe 110.00-120.00; No. 1 babbitt 70.00-75.00.

Aluminum: Clippings 2S 21.50-22.00; old sheets 17.00-17.50; crankcase 17.00-17.50; borings and turnings 13.00-14.000.

DAILY PRICE RECORD

1951	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Apr. 17-26	24.50	16.80	17.50	142.00	19.00	42.00	50.50	90.16
Apr. 12-16	24.50	16.80	17.50	147.00	19.00	42.00	50.50	90.16
Apr. 9-11	24.50	16.80	17.50	150.50	19.00	42.00	50.50	90.16
Apr. 6-7	24.50	16.80	17.50	150.00	19.00	42.00	50.50	90.16
Apr. 5	24.50	16.80	17.50	149.875	19.00	42.00	50.50	90.16
Apr. 4	24.50	16.80	17.50	150.00	19.00	42.00	50.50	90.16
Apr. 3	24.50	16.80	17.50	149.50	19.00	42.00	50.50	90.16
Apr. 2	24.50	16.80	17.50	150.50	19.00	42.00	50.50	90.16
Mar. Avg.	24.50	16.80	17.50	145.73	19.00	42.00	50.50	90.16
Feb. Avg.	24.50	16.80	17.50	182.716	19.00	42.00	50.50	90.16
Jan. Avg.	24.50	16.80	17.50	171.798	19.00	35.462	50.50	88.890

NOTE: Copper; Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Apr. 19, 1951

STEELMAKING SCRAP COMPOSITE

Apr. 26	$44.00
Apr. 19	44.00
Mar. 1951	44.00
Apr. 1950	29.40
Apr. 1946	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

No. 1 Heavy Melting Steel (Grade)1

Basing Point	Dealer, Industrial	Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Point, Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 2 Heavy Melting	—$2.00
3. No. 1 Busheling	Base
4. No. 1 Bundles	Base
5. No. 2 Bundles	— 3.00
6. Machine Shop Turnings	—10.00
7. Mixed Borings & Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry Steel:	
20. 2 feet and under	+ 2.00
21. 1 foot and under	+ 4.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00

Special Grades

25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and open-hearth furnaces or foundries.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 heavy melting steel less $15.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap.

2. No. 2 Heavy Melting Steel	—$2.00
3. No. 2 Steel Wheels	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, switches	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames	
22. Uncut	Base
23. Cut	+ 3.00
24. Angle, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14.

(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.

(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise ceiling shall not exceed that for base grade (No. 1).

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shippingping point:

Cast Iron:	
1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 3 cast iron.

(2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 1, No. 2 or No. 3, $8.
(2) For hydraulically compressing Grade No. 4, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3.
(4) For preparing into Grade No. 25, $6.
(5) For preparing into Grade No. 19, $6.
(6) For preparing into Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) For preparing into Grade No. 17 or Grade No. 21, $11.
(8) For preparing into Grade No. 18 or Grade No. 20, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6.
(3) For preparing into Grade No. 16, $4.
(4) For preparing into Grade No. 17, $5.
(5) For preparing into Grade No. 18, $7.
(6) For preparing into Grade No. 21, $4.
(7) For preparing into Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7.
(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

No preparation charge in excess of charges set forth above may be made for preparation of any grade of scrap unless the consumer has secured prior written OPS approval.

Commissions

No commissions shall be payable to a broker in excess of $1.

Unprepared Scrap

The term "unprepared scrap" shall have its customary trade meaning.

For unprepared scrap, other than materials suitable for hydraulic compression, ceiling basing point prices shall be $8 per ton beneath ceiling of the prepared base grades.

For unprepared material which when compressed constitutes No. 1 bundles, ceiling basing point price shall be $6 per ton beneath ceiling for No. 1 bundles; or when compressed constitutes No. 2 bundles ceiling basing point price shall be $8 beneath ceiling basing point price for No. 2 bundles.

Any iron casting which cannot be broken with an ordinary drop into Grade No. 1 or No. 2 may not be classified as Grade No. 3. Where such iron casting requiring blasting or other special preparation is sold to a consumer, the shipping point price for Grade No. 3 must be reduced by amount of additional charges required for preparation.

Special Pricing Provision

Ceiling price of clean cast iron foundry runouts, spills, or cupola drops prepared by cleaning or breaking is 75% of corresponding cast iron grade.

Premiums for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton:

Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c.
Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa., 53c; Buffalo, 83c; Butler, Pa., 65c.
Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (including Chester, Pa.), 70c; Cleveland, 76c.
Coatesville, Pa., 50c; Conshohocken, Pa., 20c.
Detroit, 95c; Duluth, Minn., 50c.
Harrisburg, Pa., 51c; Houston, Tex., 57c.
Johnstown, Pa., 75c.
Kansas City, Mo., 78c; Kokomo, Ind., 51c.
Middletown, O., 26c; Midland, Pa., 75c; Minnequa, Colo., 33c; Monessen, Pa., 51c.
Phoenixville, Pa., 51c; Pittsburg, Calif., 65c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c.
St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 59c; Sharon, Pa., 75c; Sparrows Point, Md., 20c; Steubenville, O., 51c.
Warren, Pa., 75c; Weirton, W. Va., 70c.
Youngstown, 75c.

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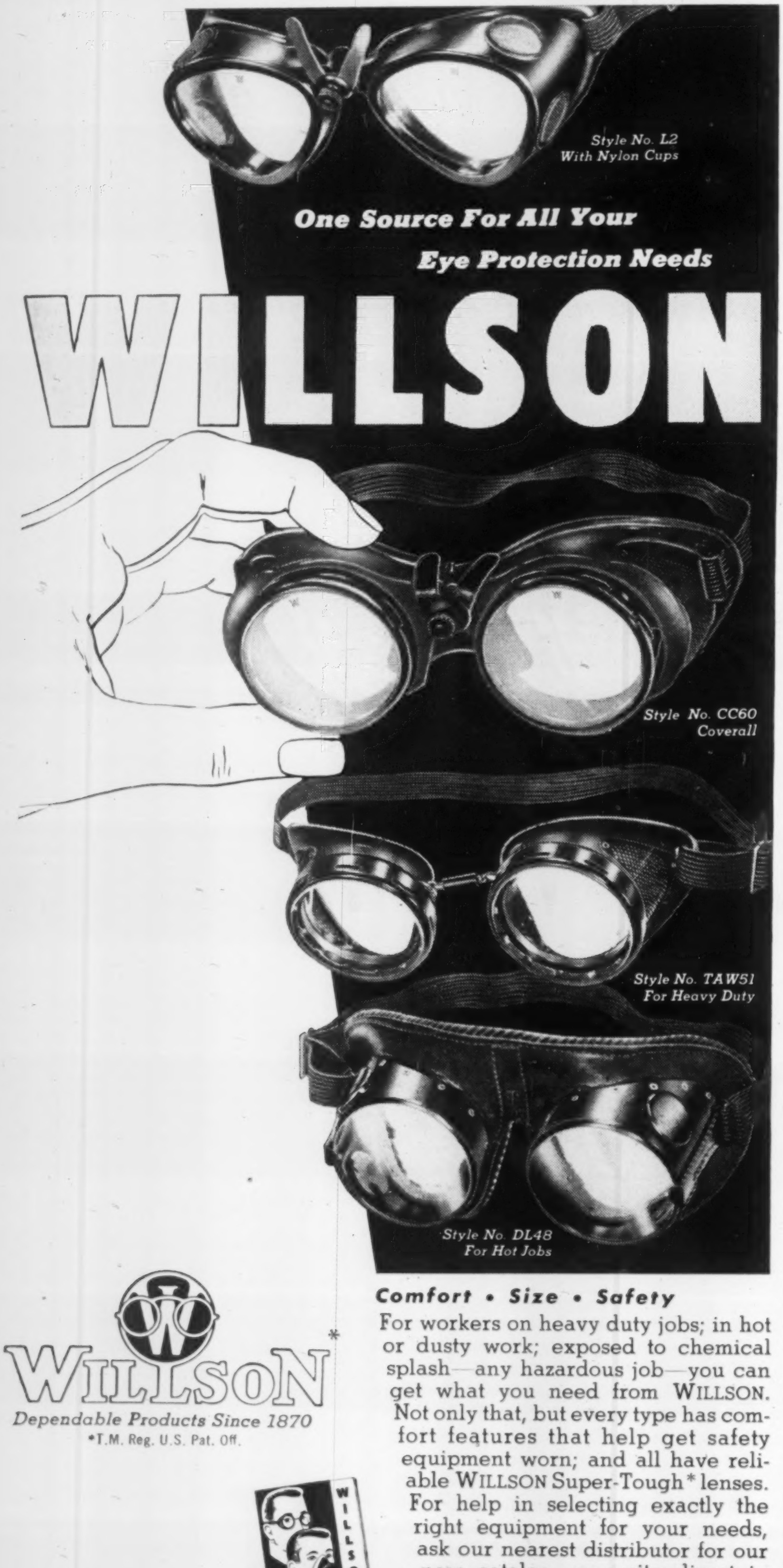

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Sheets, Strip . . .

Sheet and Strip Prices, Page 101 & 10

Chicago—Proportion of DO tonnage on mill books is still rising. Producers anticipate steady expansion in such requirements over the summer as the armament program gets into full swing. One leading producer reports its DO bookings on cold-rolled sheets now extend to November, on hot-rolled strip, slit edge, to February, 1952, and hot-rolled sheets to January, 1952. It is accepting business on regular account only for June and intimates it may not be able to meet all requests for such tonnage that month.

Considerable conversion business is reported. Sheets, however, are not so prominent on such account as was the case some months back. Indicative of the extent of conversion volume, Inland Steel Co. reports its conversion business in the first quarter this year set a new high mark, amounting to 16 per cent of the company's shipments. Conversion is continuing in about the same volume in second quarter on the basis of arrangements already concluded.

New York—In general, hot and cold-rolled sheets can still be had on DO ratings for August delivery. Some mills have little left for that month, but the situation generally has not changed greatly over the past week. Of all major items carbon sheet deliveries are probably advancing the most slowly at this time. On certain specialties, however, the story is different. Silicon sheets are being offered against DO ratings for shipment well into October and beyond. Certain types of coated sheets cannot be had before October, although some mills can promise the ordinary galvanized sheet for August and September. Promises on stainless sheets are not advancing as rapidly as they were, July tonnage being available.

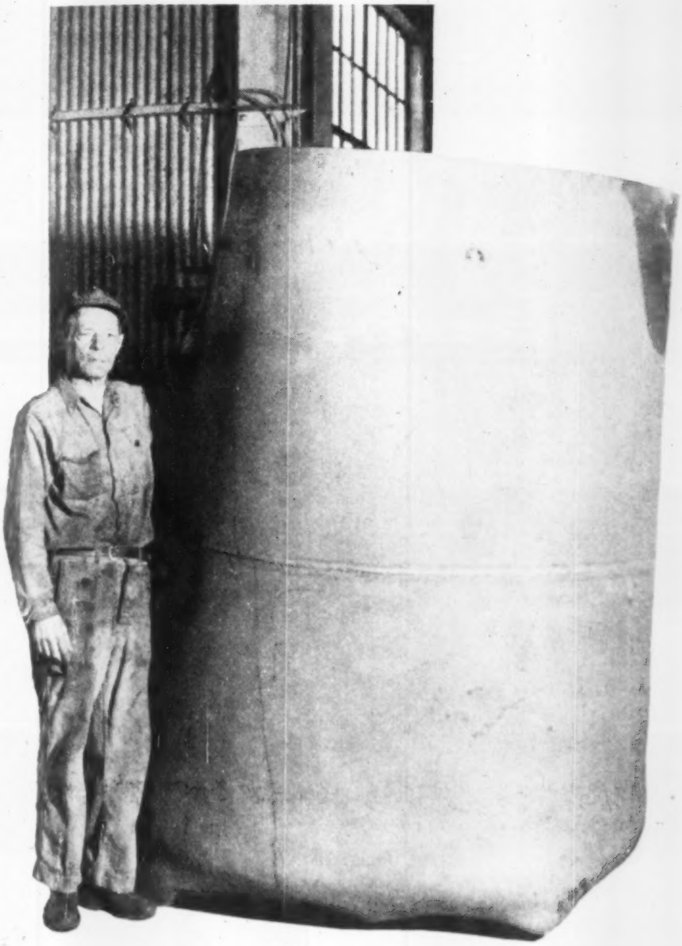
Philadelphia—Sheet demand exceeds supply, but pressure is not as strong as for plates and bars. Hoffman Industries, Reading, Pa., has purchased a 42-in, one stand 4-high cold reducing mill, for which will be required a substantial tonnage of hot-rolled bands monthly. The mill will be in addition to 16 and 22-in. mills now operating.

Boston—Further evidence of easing off in some consumer hard goods is indicated by a decline in new orders. Not much change in production assemblies or in steel buying is noted. One consumer in the consumer durable field, has held up steel allocation. Others are starting production of fall lines earlier than usual. Defense orders are heavier. Westinghouse Electric Corp., Springfield, Mass., booked a substantial order for water coolers for the Army with stainless steel tops.

Pittsburgh—Consumers' sheet inventories are low. Demand pressure for hot and cold-rolled sheets is increasing. Hot rolled are virtually unavailable with 32 per cent DO set-aside and 24 programs drawing tonnage from producers. Directives to furnish tonnage to agricultural machinery manufacturers will take a 7 per cent portion of June production.

Cleveland—There is as yet no reflection in sheet demand at the mill level of reported slackening of activity in consumer goods industries.

"A remarkable case of
HEAT RESISTANCE"



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This, partly at least, is explained by the fact cutbacks in sheet tonnage to such interests in recent months left them with insufficient volume to fully meet even curtailed manufacturing schedules. Further, most manufacturers are taking in as much steel as they can get in the hope of building up badly depleted inventories.

Cincinnati — Sheet mills, completing June schedules, note that set-asides and directives are cutting further into production, leaving less tonnage for civilian needs.

Plates . . .

Plate Prices, Page 101

Philadelphia—Boiler and pressure vessel fabricators, with a DO-45 rating good for only May and June, are much concerned about needs for the months following. They do not know how the CMP is going to affect them but they would like to get ratings for July and August before the plate mills get completely booked up for those months. The Conshohocken, Pa., producer will suspend plate production for the greater part of July because of necessity for making repairs to its finishing mill.

Boston — Distribution through the Controlled Materials Plan is expected to eliminate watered plate tonnage and result in better matching of volume with component steel products for fabrication of finished structures. Lack of plates is not the critical factor in freight car construction, but rather center sills, special shaped bars and other parts. Plate mills are diverting at least 60 per cent of rollings to defense.

New York—Some tank fabricators are promising 12 to 15 months on non-rated requirements and six to seven months on rated work. Plate mills are quoting August and September rollings with few exceptions. Municipalities and states plan work in the hope they will get ratings. One small community, for instance, points out that in the case of an A-bomb attack in a nearby metropolitan area, it would be called upon to take care of many refugees from the bombed area. Therefore, it is important that it have more water tank facilities and that these facilities be given a rating.

Pittsburgh—Plate supply is extremely tight. DO set-asides and defense-support programs are mounting. Plate production on continuous mills is increasing but demand has increased faster.

Chicago—Plate fabricators could use much more tonnage than they are receiving. One interest here says it has need for 300 per cent more tonnage for unrated account than it is getting. As a result, considerable work, fuel tanks, etc., is being delayed indefinitely.

Los Angeles—Plate deliveries have improved. Even with two months non-rated production blanked out and allocations reduced up to 50 per cent in the last six months, some fabricators are getting more non-rated plate tonnage in better delivery than rated.

Seattle—Aside from pending award of 1000 tons of plates for completion of McNary dam, plate tonnages involved in current jobs are small. Several sizable tanks are up for bids at government projects in this state, but details are not released.

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A Cleveland Tramrail User Writes:

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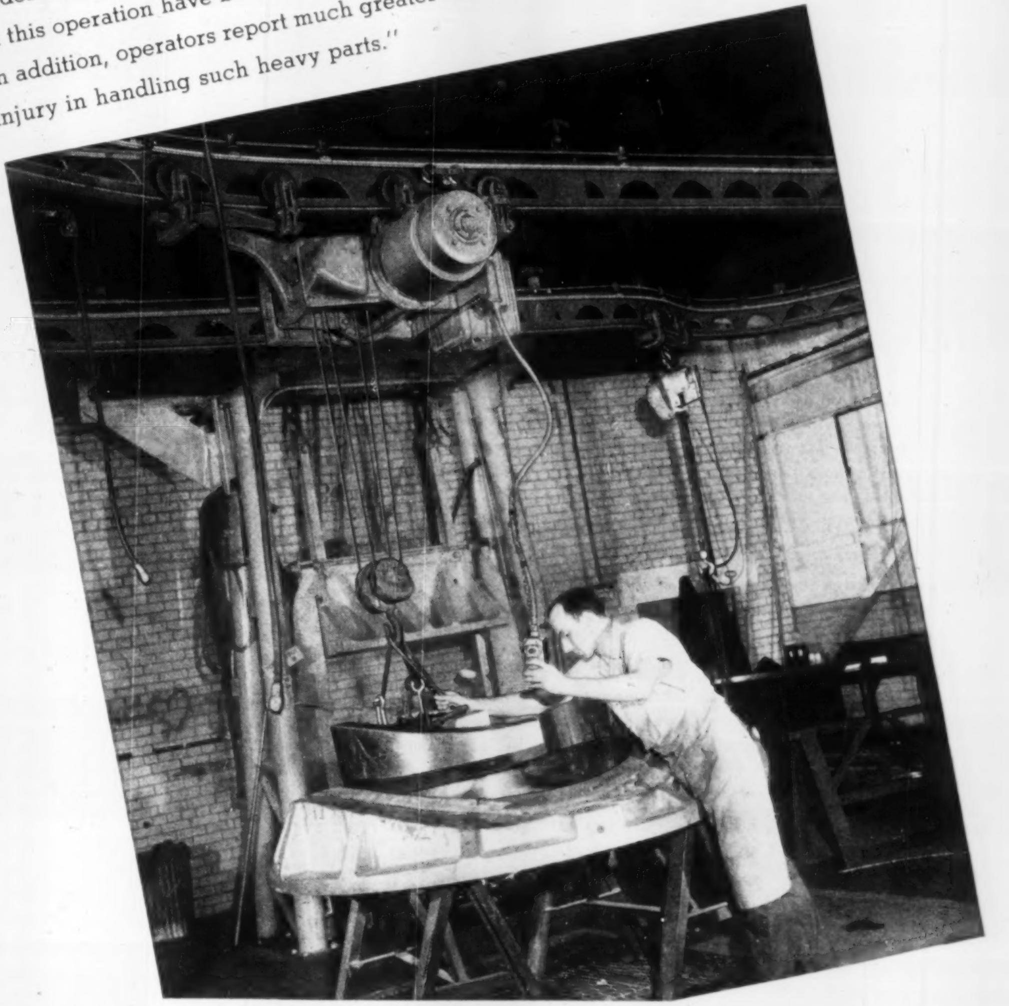

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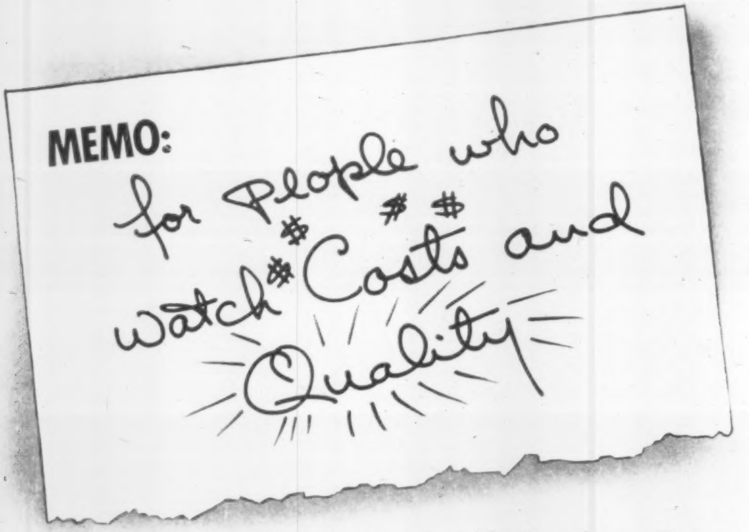
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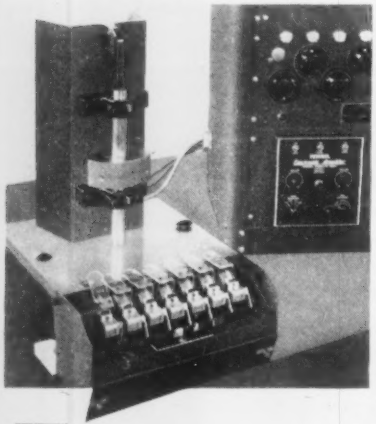

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Wire . . .

Wire Prices, Page 103

Boston—Incoming orders for alloy wire are two to three times those for carbon. Most alloy volume is covered by ratings. First serious reduction in allotments to nonrated consumers of carbon wire are in the making. Procurement for defense has not reached anywhere near peak and is increasing with more subcontracting. Complicating the wire production problem is limited rod supply.

Philadelphia—Wire rope is in tighter supply. Mill deliveries now run 10 to 12 weeks and longer. There are not the heavy requirements for the lashing of ocean cargoes that there were in the last war, but there is a stepping up in needs of ship yards and other heavy industries.

Los Angeles — District wire mills previously able to supply almost all of district fabricators' requirements for wire are falling behind on commitments. Fabricators report wire mesh tightest of all steel products.

Steel Bars . . .

Bar Prices, Page 101

New York—Promises on DO ratings are varied, depending upon mills and on specifications. One large producer has nothing to offer on hot carbon bars before September and on certain of the larger sizes nothing before late fourth quarter. Promises on hot alloy bars fall in October and November. In the case of another large seller hot alloy bars against DO ratings are being offered as early as late August and cold finished alloy bars as early as September; if there is annealing, November is the best that can be done. In fact, annealing facilities are a bottleneck in most plants.

Boston—Hardware inventories are heavy. New orders are slower with credit tightening. Nevertheless, carbon and alloy bars are among the most critically short steel products with rated orders increasing. Direct defense and subcontracts are being placed at narrow cost-profit margins. Prime contractors are farming out more work. Not until fourth quarter is CMP expected to be working smoothly.

Pittsburgh—Hot rolled bars are critically scarce. However, small quantities are reported available from some brokers.

Cold-finished bar supply is very short with DO set-asides and program requirements taking larger bites. Availability of hot rolled bars directly determines cold finished production by nonintegrated interests. These have been cut to the point operations on existing levels may have to be curtailed.

Cleveland—The shortage of commercial bars is described as increasingly acute. With more tonnage constantly moving into defense channels unrated buyers are running into more difficult supply problems. The situation is expected to get much worse before it gets better. Considerable conversion bar business is reported. In fact, conversion bar tonnage is said to be equal to that in sheets for some converters.

Chicago—Rising volume of defense

and defense-support orders is steadily cutting into supplies of bars for regular civilian consumers. June farm implement needs will be heavier and will force further cutbacks in quotas on civilian goods account. Cold-finished bar producers could use more hot bars with defense demand running up to 70 per cent of output.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 101

Washington—Office of Price Stabilization is preparing a pricing regulation to cover the concrete reinforcing bar industry. Members of the industry's advisory committee are not in agreement on the type of order which would be best suited to the industry. Some favor a pricing formula based on a flat dollars-and-cents markup over mill base prices, plus quantity and other extras; others, a formula permitting each seller to use his own historical markup during a prescribed base period.

Chicago—Volume of defense and defense-support orders for reinforcing bars continues to mount. One producer here now has nothing to offer on DO account before January-February, 1952.

Los Angeles—Substantial tonnages are scheduled for placement next month as customers' rush to get projects under way before construction curbs spread. First units of $16 million construction project at Naval Air Missile Test Center and Air Station, Point Mugu, are out for bids.

Seattle—Rolling mill production continues at capacity. Efforts are being made to expedite deliveries and reduce substantial backlogs. Northwest Steel Rolling Mills Inc., Seattle, may have to curtail operation as furnaces cannot melt sufficient ingots to keep the plant at top production.

Tubular Goods . . .

New York—Distributors of plumbing accessories are over-extended on their inventories. Decline in building construction has adversely affected demand and manufacturers of plumbing supplies and accessories are, if anything, stepping up their shipments, moving in extra commitments which had been in arrears. As a result some distributors are offering discounts to consumers in an effort to raise cash for meeting bank obligations and at the same time are asking their suppliers of pipe for a little easier credit meanwhile.

However, as for pipe inventories, they, if anything, are on the tight side, in direct contrast with the situation in plumbing supplies. Pipe demand has been adversely affected by a slowing up in building construction, but there are various other outlets for pipe which continue highly active.

Mechanical tubing and boiler tubing continue tight. Some producers are booked late into 1952 and even beyond and are accepting no business without a priority rating.

Boston—Demand for electric welded tubing for car and bus seats is heavy. Volume of stainless or plated tubing is high. Distributors are buliding up better inventories of buttweld pipe, but tight supply in seamless prevents improvement in those sizes; also in pressure and mechanical tubing.

Washington—Reusable iron and steel pipe prices are out of line in some areas, but members of the industry's advisory committee advise OPS that consideration must be given to the fact sufficient margins over cost must be obtained if idle pipe is to be reconditioned for further use. Sale price of used pipe has advanced 50 to 100 per cent over the cost of new pipe in some instances, largely because of higher reconditioning costs and unusual demands. Basis for establishing ceilings under the pricing regulation being prepared by OPS will be a percentage relationship between the sale price of reusable pipe products and the cost of new pipe, if the industry's recommendations are followed.

Structural Shapes . . .

Structural Shape Prices, Page 101

New York—March shipments of fabricated structural steel of 194,774 tons were the highest reported since October, 1947, reports the American Institute of Steel Construction. They exceeded those of the preceding month by 16.7 per cent. Meanwhile, bookings totaling 230,406 tons exceeded 200,000 tons monthly for the tenth consecutive month, for an average of 247,893 tons for the 10-month period, or for an annual rate of 2,974,700 tons.

Backlogs for the next four months only, as of Apr. 1, amount to 798,356

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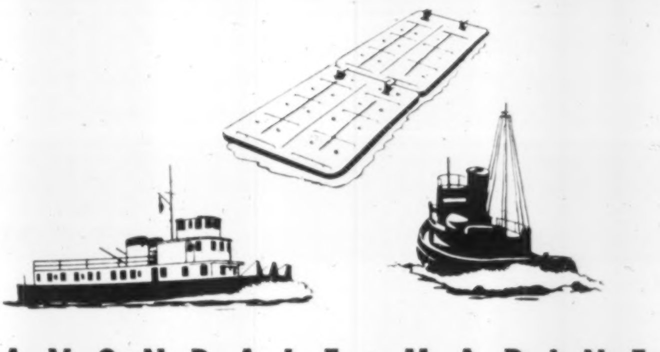

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tons and for beyond that period another 1,514,980 tons, or a potential volume of 2,313,336 tons against 2,228,495 tons at the beginning of the previous month.

March awards compare with revised figures for February and January of 205,184 tons and 287,244 tons, respectively. March shipments compare with revised figures for those two months of 166,929 tons and 179,052 tons, respectively.

Boston—An estimated 30,000 tons are expected to be bid this quarter for the Central Artery, Boston. Charlestown Connection, 7000 tons, went to the Harris Structural Steel Co., New York. That fabricator booked 14,200 tons for New England projects recently. Bids on the Merrimac river bridge, 4250 tons, superstructure have been rejected.

Philadelphia — Structural fabricators are fighting increasingly shy of non-rated work. Severe cuts in nonrated allotments by the mills in June have tended to sharpen their attitude in this respect. Most fabricators are booked up 12 to 14 months on the basis of receipts from the mills.

Pittsburgh—Structural steel supply is very tight. Fabricators are taking all the shapes they can get. Seasonal increase in construction is expected despite restrictions on certain types of building. Industrial development in this area takes a substantial portion of the structural tonnage produced.

Cleveland — Substantial volume of building is being deferred in this area because of inability to obtain structurals and other building steel items in reasonably early delivery time. With DO and defense-support orders taking an increasing tonnage of structurals, fabricators are shying away from unrated work. Considerable public construction is understood to be standing by for the present.

Seattle—U. S. engineers are receiving numerous bids for military installations in Alaska involving several large structural tonnages, awards to be made in the immediate future. Works affected by the recent walkout are back on the job. Operations are being stepped up. Many small contracts have been taken by plants. Small shops hesitate to bid on public works as completion dates are often specified before steel deliveries can be made.

Warehouse . . .

Warehouse Prices, Page 120

Pittsburgh—Distributors are short-stocked. Structural shapes and small bars are in greatest demand. Sheets and plates are almost as critically scarce. Some producing mills have pushed M-6 allotments from April to May and an even greater supply tightening in most products is expected.

CMP is expected to change the position of distributors very little. Warehousemen think they will operate under CMP as they had expected to under the amended M-6 regulation guaranteeing them 85 per cent minimum of base period receipts. Effect of this revised order will not be felt until June.

Distributors fear CMP will not consider orders accepted by warehouse suppliers for delivery prior to July 1. In some cases warehousemen are receiving tonnage that was promised in January.

Boston—The next few weeks, or well into June, are expected to be difficult for distributors trying to fill heavy demand with depleted stocks. More are optimistic over prospects for obtaining specified warehouse allotments starting with June. Some look for slackening in consumer buying this summer with inventories down to 30-35 per cent of normal.

Philadelphia—Due to the latest amendment to regulation No. 4 relating to maintenance and repairs, warehouses are now under far less pressure in the acceptance of DO-97 ratings.

Cleveland — Warehouse sales volume this month is expected to fall below that of March. Demand is still pressing but distributors' stocks are low and unbalanced and few of them can entertain all of the business offered them. At the same time, some slackening of activity at small machine shops and fabricating plants lacking government work is noted.

Cincinnati—Warehouses are under pressure for cold-rolled bars and alloys to supply needs of machine tool manufacturers. Stocks are low and unbalanced.

Chicago—Warehouses in this area are experiencing strong demand from all consuming directions, but several note slight easing in pressure from household appliance and similar consumer goods manufacturers. Light-gage sheets appear to be most noticeably affected. The easier tone reflects slowing down in demand for appliances at the wholesale level because of substantial inventory accumulations of finished items. Meanwhile, distributors report slight improvement in tonnage receipts from the mills.

Los Angeles—Warehouse shelves are almost bare. One distributor has in stock only three of 20 to 30 usually-stocked flat-rolled products. Sales to aircraft sub-contractors of light angles and channels, bars and plates are heaviest ever. Over-all sales are down 15 to 20 per cent.

Seattle — Warehouses report a strong and steady demand for all items. The situation is becoming more acute daily. It is difficult to place new mill business and old orders placed in the East are 40 to 60 days behind delivery schedules. Coast plants also are behind, but not so far. Inventories are unusually low.

Metallurgical Coke . . .

Pittsburgh—Beehive coke supply is definitely less acute than in recent weeks. This is occasioned in part by the fact several blast furnaces continue off blast. Most purchasers take beehive coke when byproduct is not available. The market is expected to tighten early next month when it is hoped all 47 of the district blast furnaces again will be in operation.

Foundry coke remains in short supply. Shortage of pig iron is cause for greater concern among the foundries.

Chicago—Oven foundry coke supply continues tight and buyers see no prospect for early improvement in

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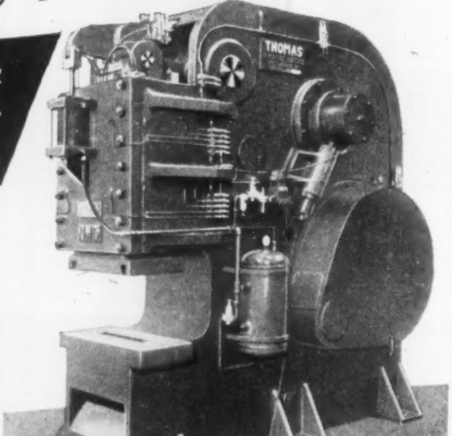

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PUNCHES · SHEARS · PRESSES · BENDERS · SPACING TABLES

ditions. Some Connellsville beehive coming into the district and is helping sustain foundry schedules.

Pig Iron . . .

Pig Iron Prices, Page 100

Philadelphia—Foundries and nonintegrated steel mills are feeling the further shrinking in pig iron supply. Some gray iron foundries are unable to use more than 15 per cent iron in their melt, the remainder being largely scrap. Certain foundries have gone back to the four-day schedule. Most foreign iron being offered at present is basic, high priced and with deliveries extended.

Pittsburgh—Foundry operations are hampered here by the shortage of pig iron. Many shops are operating on virtual day-to-day inventory. No early relief is sighted with hope for added shipments from outside this area dim.

New York—Production of pig iron in March was larger than in any previous month in history, the American Iron & Steel Institute reports. Output in the first quarter also was record-breaking.

March output of pig iron and ferroalloys was 6,015,662 tons, of which 5,946,312 tons were pig iron. First quarter production was 17,077,785 tons, including 16,884,395 tons of iron. October 1950, and fourth quarter of 1950, were the record periods previously. In March blast furnaces operated at an average of 97.7 per cent of capacity.

Buffalo—Tightness continues to grip the merchant pig iron market. Sellers still guard against civilian buyers building up inventory stocks in anticipation of heavier government needs. Military demands to date, however, are light.

Cleveland—Foundries in this area continue to worry along on short supplies of pig iron, scrap and coke. Production, however, is being sustained at high level with pig iron sellers apportioning tonnage in such fashion as to prevent serious interruption of melting schedules. Blast furnace operations in the immediate Cleveland area are at capacity, all nine stacks being in blast.

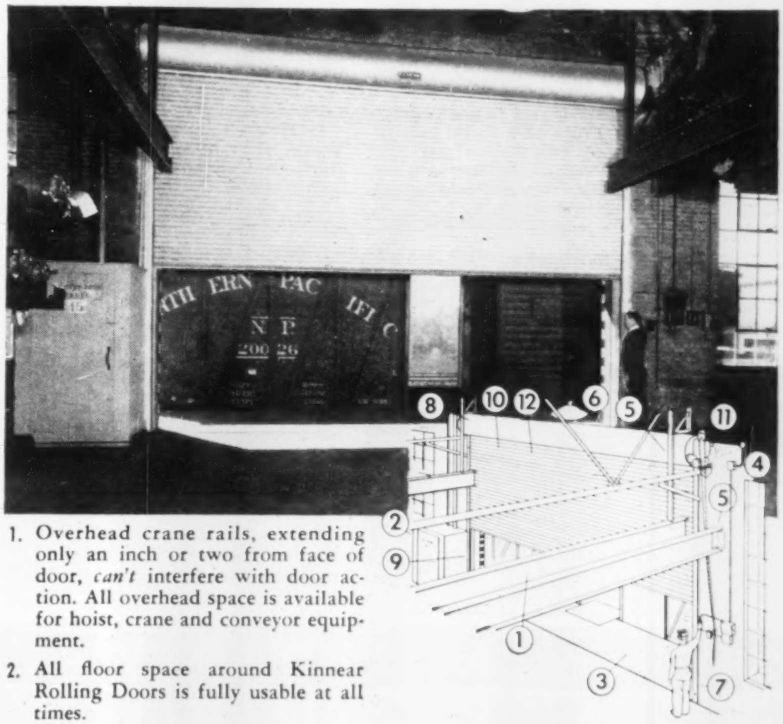
Cincinnati—The foundry melt is sustained with more iron going into machine tools.

Chicago—Foreign pig iron coming into this area is helping relieve the acute supply shortage. It is reported of good grade, and the supply along with increased scrap use is enabling foundries to maintain schedules at high level though several shops recently were forced to curtail temporarily to three days per week, largely, however, because of shortage of coke.

St. Louis—Pig iron squeeze promises to worsen next week. The blast furnaces at Granite City, Ill., which normally supply 90 per cent of the area's iron, recently was bought by Granite City Steel Co. The steel company now will take 26,000 to 28,000 of the two furnaces' 36,000-ton monthly output as against a former 15,000 tons. This is indicated in company's announcement that other customers will be allocated a total of 7000 to 8000 tons in May and June.

Seattle—Foundry operations are back to normal following a labor shutdown. Plants report ample cast

No other doors offer all these advantages



1. Overhead crane rails, extending only an inch or two from face of door, *can't* interfere with door action. All overhead space is available for hoist, crane and conveyor equipment.
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3. No sacrifice of space on narrow loading platforms with Kinnear Rolling Doors. They need no room inside or outside the building for opening and closing action.
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10. A continuous curtain of strong interlocking steel slats gives you extra protection against fire, theft, intrusion, wind, weather and accidental damage.
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12. Kinnear's interlocking steel-slat curtain is not only more rugged and longer lasting, but permits any number of slats to be individually replaced if accidentally damaged. Lower maintenance costs!

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iron scrap. The local price has been raised to ceiling on most grades, eliminating the inducement to outside buyers who have been operating in California and eastern Washington.

Scrap . . .

Scrap Prices, Page 106

Cleveland—Steel mills and foundries are surmounting difficulties in obtaining scrap to maintain operations at peak levels. This is being accomplished through considerable cross-hauling, resulting from earmarking of tonnages by mills and direct allocation by NPA. About 50,000 tons of scrap in the Chicago district was allocated last week for shipment to Valley mills. Allocations to foundries involve railroad material, for the most part, very little cast material being shipped on this basis. NPA's directive, aimed at channeling available supplies of specified scrap to operations where they are most needed, is as yet untested. This directive, dated Apr. 20, reserves certain grades of cast iron scrap for use in foundries and prohibits their use in basic open-hearth operations; bans use of electric furnace grades from use in open-hearth operations; prohibits use of foundry grades in open-hearth or electric furnace operations.

Pittsburgh—Scrap collections are better with more favorable weather. Foundries' inventories are low but improvement is expected over the next month. Dealers are not too optimistic. They state most of the industrial scrap in nearby areas has been collected and that few companies have anything to offer. Scrap yield from the country areas also may not be as great as some dealers hope.

Upgrading continues but complaints on this score are fewer.

Boston—Shortage of heavy melting steel scrap keeps down consumer inventories. Direct allocating helps some consumers but the lag in deliveries is a hampering factor. Less industrial scrap is reaching the open market and yard collections are only fair. Allocations on dealers are negligible. No. 1 heavy melting is bringing $34.17 shipping point with some upgrading. Barge rate at Providence, R. I., brings the price up to $37.25.

New York—Increasing shortage of pig iron is placing extra heavy pressure on scrap supply. Some eastern foundries are having to use about 85 per cent scrap in their mix because of stringency in pig iron. The slightly freer flow of scrap over the last few weeks has helped, but has still not checked the downward trend in scrap inventories.

Buffalo—Scrap supplies are not improving rapidly enough to satisfy mills in this area. One, which recently cut basic iron output temporarily, is paring ingot output to the point one finishing mill is expected to be idle shortly. Increases have been noted in scrap receipts from industrial sources, but gains are limited and boat receipts are not expanding as rapidly as expected.

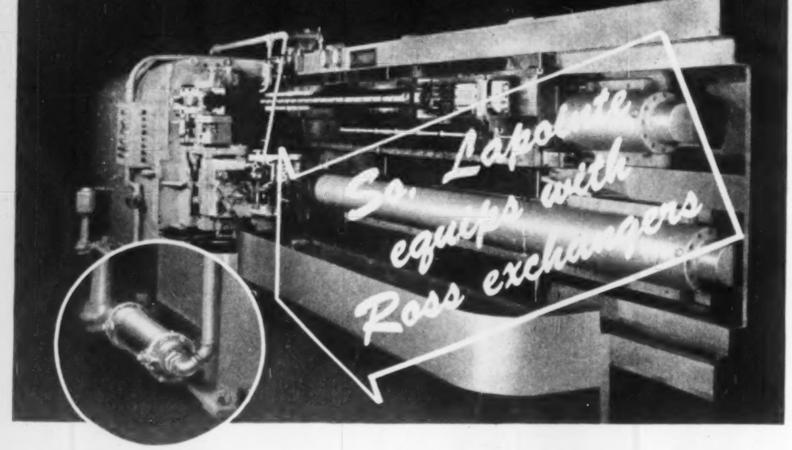
Philadelphia—Due to slightly freer supply of scrap, some consumers are able to hold their own with regard to inventories, but others are slipping. Considerable upgrading is going on and one district mill rather than take in upgraded scrap recently had to take off an open hearth temporarily. Recent revisions in Washington regulations have done little to remedy this situation. Changes, however, do eliminate open hearth and electric furnace operators from buying foundry steel, items 20 and 21, and from using certain grades of cast scrap. There also is a new ruling to the effect that trucking charges, where the material is being delivered on dealer owned trucks, can now take public carrier rates within limits of $2.50 minimum and $4 maximum.

Detroit—Minor change in OPS regulations is not expected to make significant difference in availability of scrap, although electric furnace operators may have to rely more heavily on allocated material since a few grades which they had been buying are limited to foundry use.

Cincinnati — Scrap shipments are insufficient to prevent a drain on melters' inventories. Some major interests are depending on allocations to maintain schedules. Supply problems of steel foundries are especially critical.

Chicago—Scrap is being allocated out of this district to eastern and Youngstown district mills in alarming volume. Over the past 10 days from 45,000 to 50,000 tons of melting steel moved out of this area to Youngstown steelmakers under orders of the Office of Price Stabilization. As a result local mills are increasingly apprehensive for future

AUTOMATIC, NON-STOP BROACHING COUNTS ON PEAK PUMP CAPACITY



Fully automatic and continuous in operation, this double ram horizontal surface broaching machine does jobs that formerly required seven machines, says its manufacturer, The Lapointe Machine Tool Co. of Hudson, Mass.

Clearly, its high rating, for producing such parts as cylinders and connecting rods for heavy duty truck engines, cannot risk work stoppage or slowdown through lost hydraulic pump capacity. So, Lapointe furnishes a Ross Type BCF Exchanger as a built-in component . . . to assure that hydraulic oil will be maintained at safe and effective temperatures. Failures through pump slippage and internal leakage, accelerated breakdown of vital oil properties and malfunction of precision-controls, are thus averted.

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supplies. At least one of them is in a threatening inventory position and may have to close down several openhearths within a month unless its scrap supply improves.

Washington—A special railroad tariff, establishing reduced rates on scrap metal to move World War II surplus and obsolete items, should be permitted to expire July 1, Interstate Commerce Commission rules. Under the tariff setting up the reduced rates, shippers and receivers must certify that the metal shipped is scrap and good for remelting only.

St. Louis—Scrap buying is slow despite improving shipments. Both mills and foundries hold under 30 days' supplies on the average. A few non-defense foundries are lower.

Los Angeles—With scrap in short supply dealers charge reciprocal "deals" between steel producers and customers are reducing purchased scrap volume.

San Francisco—NPA allocated some scrap to the Pacific northwest at the expense of local mills, already in a tight fix to maintain adequate inventories.

Iron Ore . . .

Iron Ore Prices, Page 120

Cleveland—Mills are operating blast furnaces at capacity, allowing for normal shutdowns for repairs and relining. At the beginning of this month 175 furnaces were in blast in this country compared with 177 a month earlier and 169 a year ago, while the number idle were 10, 7 and 17, respectively. Of 10 furnaces in Canada, only one was idle on Apr. 1 against three a year ago.

Consumption of iron ore increased in March to 7,371,888 gross tons from 6,434,581 tons in February. The average for the last 12 months is 7,212,042 tons.

The industry's stock position was comfortable when lake shipping got under way. Stocks at furnaces in the United States totaled 14,337,617 tons on Apr. 1 compared with 19,478,799 tons a month earlier. While stocks were larger a year ago at 16,206,668 tons, a delay in resumption of the lake shipments placed the furnaces in a critical supply position by May 1. Stocks on Lake Erie docks amounted to 2,416,557 tons on Apr. 1 compared with 3,799,104 tons on Mar. 1 and 4,035,444 tons on Apr. 1, 1950.

Cleveland—Shipping of iron ore on the Great Lakes is at record pace. Pittsburgh Steamship Co.'s fleet loaded 726,330 tons in the week ended Apr. 23, the largest tonnage loaded for this comparable period at the opening of the season. This record was accomplished in spite of the fact that two of the firm's vessels are still not in commission. The *Eugene W. Pargny* and *Homer D. Williams*, having a capacity of 25,000 tons a week, are being repowered. Shipments by the industry for the week ended Apr. 23 amounted to 2,113,791 tons, making the total for the season to date 3,517,906 tons.

Baltimore—Formal opening of Baltimore & Ohio railroad's $5 million ore pier in the local harbor will be held May 15. This pier will expedite movement of iron ore from Liberia, Venezuela, Chile, Cuba and other foreign sources. Manganese and chrome

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ore also will be handled. The pier has two ore unloading machines with combined capacity of 2000 tons an hour and is capable of transloading from ships to rail hopper cars as much as 10 million tons a year.

Tungsten Ore . . .

Tungsten Ore Prices, Page 120

Washington—Miners who want to sell tungsten to the government at a guaranteed price of $63 a ton must notify General Services Administration at its nearest regional office by June 30. Purchases, beginning July 1, will be made only from those who have given prior notice of their intention to prospect for or produce tungsten. The guaranteed price offer applies only to: Newly discovered or developed ores; production above 1950 levels, where there is existing production, with some exceptions to be approved by GSA.

Purchases will be made up to a total not to exceed 1,468,750 short ton units. The metal will be bought on a "first come first served" basis until the tonnage goal is reached. This total may be increased if additional funds become available.

GSA regional offices in mining areas are located at: 911 Walnut St., Kansas City, Mo.; 1114 Commerce St., Dallas; Bldg. 1-G, Denver Federal Center, Denver; 630 Sansome St., San Francisco; U. S. Courthouse, Seattle.

Tool Steel . . .

Philadelphia—Tool steel is in more active demand. For a long time after the last war tool steel was a veritable drug on the market. Today various specifications can still be had out of mill stocks, but on anything that has to be made up, deliveries range from 10 weeks to double that time.

Canada . . .

Toronto, Ont.—Canadian iron and steel production in February attained the highest daily rate in history. Production of pig iron totaled 193,227 net tons, daily average of 91.7 per cent for January and 157,200 tons or 74.6 per cent for February, 1950.

Production of ferroalloys in February amounted to 14,914 net tons against 23,079 tons in January and 9652 tons in February, 1950.

Production of steel ingots and castings totaled 281,380 net tons or a daily average of 92.2 per cent of total capacity and compares with 309,653 tons or 91.6 per cent in January and 258,123 tons or 84.6 per cent for February, 1950.

For the first two months this year production of pig iron amounted to 390,252 net tons compared with 347,632 tons in the like period of 1950. Output of ferroalloys amounted to 37,993 tons against 19,613 tons. Production of steel ingots and castings for the two months was 591,033 net tons against 281,380 tons last year.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

280 tons, galvanizing plant, melting mill, craneway, etc. for Seidelhuber Iron & Bronze Works, Seattle, to Leckenby Structural Steel Co., Seattle.

260 tons, hangar at Bellevue, Wash., reactor plant addition, automobile salesroom and several schools, local and in Alaska, to Leckenby Structural Steel Co., Seattle.

200 tons, paper container plant at Yakima, Wash., to Pacific Car & Foundry Co., Seattle.

200 tons, guides and frames emergency outlet gates, Lookout Point dam, Willamette river, to Schmitt Steel Co., Portland, Oreg., low, $59,782, by U. S. Engineer.

100 tons, Boeing airplane plant improvements, Seattle, to Leckenby Structural Steel Co., Seattle.

STRUCTURAL STEEL PENDING

4500 tons, superstructure, embankment road section, Central Artery, Boston; bids May 15.

2100 tons, nurses home, Bellevue Hospital, Manhattan, New York; Depot Construction Co., Brooklyn, N. Y., low on general contract.

1700 tons, East Side airline terminal and parking garage, Triborough Bridge & Tunnel Authority, New York; bids May 15.

1060 tons, state bridges, Union county, New Jersey; bids May 15.

1000 tons or more, intake gates and appurtenances McNary dam powerhouse; Willamette Iron & Steel Co., Portland, Oreg., low sole complete bidder on two schedules, $4,489,059.

1000 tons, Ross dam powerhouse; bids in to Seattle, Apr. 24.

700 tons, Public School No. 107, Bronx, New York; bids closed Apr. 24.

175 tons, spillway gates, hoists, etc., third phase Ross dam; bids to Seattle, May 18.

110 tons, Pennsylvania Railroad bridge, Allegheny county, Pennsylvania; bids May 7.

Unstated, permanent heating and power plant, Whittier, Alaska, $1½ million project; bids to U. S. Engineer, Seattle, May 25.

Unstated, outside utilities and 10 miles railroad trackage, Fort Richardson, Alaska; bids to U. S. Engineer, Seattle, May 5.

Unstated, steel frame warehouse; bids to Alaska Road Commission, Juneau, Alaska, May 14.

Unstated, utilities and structures army project, North Richland, Wash., second call for bids in Apr. 20.

Unstated, Chena river and Noyes Slough bridges, Alaska; J. J. Badraun, Seattle, low to Alaska Road Commission, $458,359.

Unstated, shop building, Mount Rainier Ordnance Department, Washington State; George E. Teufel Co., Seattle, low $209,774.

Unstated, Coeur d'Alene river bridge, Idaho; bids for erection to Bureau of Public Roads, Boise, May 3; steel previously purchased by government.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1200 tons, National Cash Register Co., Dayton, O., to U. S. Steel Suply Co., Chicago.

540 tons, apartment building, Chicago, to Dean Co., Chicago.

525 tons, townhouse, Chicago, to Dean Co., Chicago.

450 tons, Midwest Gummed Paper Co., Chicago, to Jos T. Ryerson & Sons Co., Chicago.

450 tons, Northwestern Steel & Wire Co., Sterling, Ill., to Truscon Steel Co., Youngstown; 450 tons also to Ceco Steel Products Co., Chicago.

450 tons, Eielson air field, Alaska, barracks, to Bethlehem Pacific Coast Steel Corp., Seattle; Chris. Berg Inc., Seattle, general contractor.

245 tons, Denny junior high school, Seattle, to Bethlehem Pacific Coast Steel Co., Seattle; Strand & Son, Seattle, general contractors.

185 tons, Akron, O., city hospital, to United States Steel Supply Co., Chicago.

135 tons, U. S. Engineers, New Haven, Ind., to Ceco Steel Products Co., Chicago.

125 tons, Hale elementary school, Chicago, to Ceco Steel Products Co., Chicago.

100 tons, tower foundations for Seattle light department and other projects, to Bethlehem Pacific Coast Steel Corp., Seattle.

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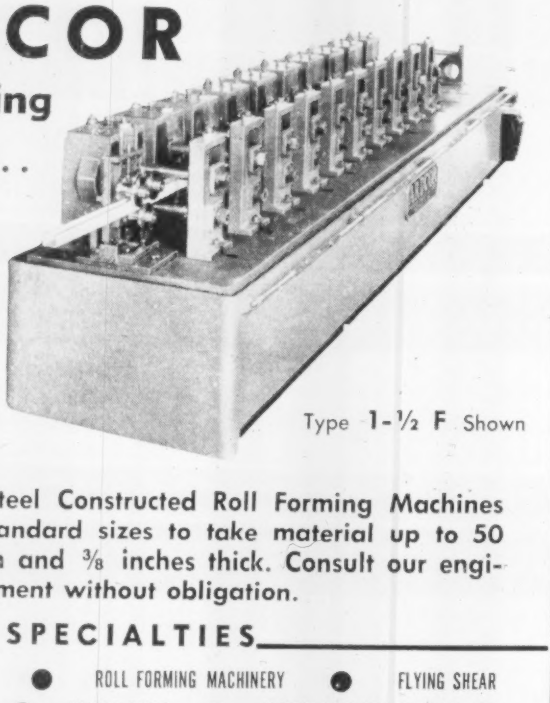
Machines . .



Type 1-½ F Shown

ARDCOR All Steel Constructed Roll Forming Machines are built in standard sizes to take material up to 50 inches in width and ⅜ inches thick. Consult our engineering department without obligation.

ARDCOR SPECIALTIES

ARDCORLOY ROLLER DIES ● ROLL FORMING MACHINERY ● FLYING SHEAR AND CUT-OFF MACHINES ● CRADLE REELS ● SPECIAL PRODUCTION MACHINERY

American ROLLER DIE CORPORATION
20700 St. Clair Avenue ● Cleveland 17, Ohio

REINFORCING BARS PENDING

1100 tons, engine plant, Cleveland.

275 tons, Hospital, Miami, O.

202 tons, storm sewer, Congress Street superhighway, Chicago.

150 tons, Dow Chemical Co., Midland, Mich.

150 tons, pump station, Congress Street superhighway, Chicago.

107 tons, extension to Lincoln Park highway, Chicago.

Unstated, telephone exchange building, Fort Richardson, Alaska; bids to U. S. Engineer, Seattle, May 4.

Unstated, telephone exchange building, Eielson Air force base, Alaska; bids to U. S. Engineer, Seattle, May 4.

Unstated, three-span county bridge, Snoqualmie river, Washington state; second bids to County Commissioners, Seattle, Apr. 30.

PLATES . . .

PLATES PENDING

4833 tons, 72-inch fabricated steel pipe, New Jersey District Water Supply Commission, Wanaque, N. J.; Bethlehem Steel Co., low bidder.

Unstated, 6824 feet 78 inch, tar coated water pipe; bids to Tacoma, Wash., May 7.

PIPE . . .

CAST IRON PIPE PENDING

200 tons, 12 and 8 inch cast iron pipe, also alternatives; bids to Mrs. Della Livingood, city clerk, Union Gap, Wash., May 2.

100 tons, 9470 feet 8 and 4 inch, also alternatives; bids to F. A. Reil, city clerk, Redmond, Wash., Apr. 25.

RAILS, CARS . . .

LOCOMOTIVES PLACED

United States Steel Co., sixteen 1200-hp diesel-electric switchers, divided equally between Baldwin-Lima-Hamilton Corp., Eddystone, Pa., and Fairbanks, Morse & Co., Chicago. Locomotives will be for use at the Fairless Works.

LOCOMOTIVES PENDING

Canadian National, twenty 3008-hp diesel-electric road locomotives; proposed for purchase this year, under railroad's 1951 budget.

RAILROAD CARS PLACED

Clinchfield, 500 fifty-ton hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

Detroit & Mackinac, 100 fifty-ton box cars, to General American Transportation Corp., Chicago; 100 fifty-ton flat bottom gondolas, to Pressed Steel Car Co., Chicago.

Florida East Coast, 75 seventy-ton covered hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

Minneapolis, St. Paul & Sault Ste. Marie, 350 fifty-ton box cars and 200 fifty-ton gondolas to its own shops.

New York Central System, 4550 freight cars and 200 cabooses; of this number, 1000 hoppers will be for operation by Pittsburgh & Lake Erie, a subsidiary line. Awards were made to Despatch Shops Inc., East Rochester, N. Y., 2500 fifty-five ton hopper cars and 1000 fifty-five ton box cars; Pullman-Standard Car Mfg. Co., Chicago, 1000 fifty-five ton hopper cars; General American Transportation Corp., Chicago, fifty 12,500-gallon tank cars; St. Louis Car Co., St. Louis, 200 caboose cars. This brings the total placed by this system to 7050 cars at a cost of $41 million.

Pittsburgh & West Virginia, 5 thirty-ton caboose cars, to International Railway Car & Equipment Mfg. Co.

Richmond, Fredericksburg & Potomac, 50 seventy-ton gondola cars, to General American Transportation Co., Chicago.

Union Tank Car Co., fifty 11,000-gallon propane tank cars, to American Car & Foundry Co., New York.

Western Fruit Express Co., 300 fifty-ton refrigerator cars, to its own shops.

Wabash, one dome-parlor-lounge car, to Pullman-Standard Car Mfg. Co., Chicago.

RAILROAD CARS PENDING

Denver & Rio Grande, 1000 seventy-ton drop bottom gondolas; bids asked.

Dominion National, 5500 box cars and 500 refrigerator cars, specified for purchase under 1951 equipment program.

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SHAPES • BARS • TUBES

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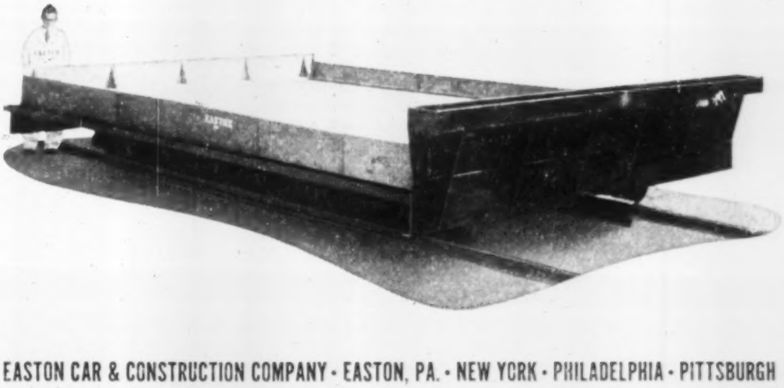

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WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floo
New York (city)	6.27	7.29	8.44	6.59	...	6.42	7.29	9.25	6.40	6.58	8.04
New York (c'try)	5.97	6.99	8.14	6.29	...	6.12	6.99	8.95	6.10	6.28	7.74
Boston (city)	6.40	7.20	8.49	6.35	...	6.25	7.04	9.25	6.40	6.98	7.88
Boston (c'try)	6.20	7.00	8.29	6.15	...	6.05	6.84	9.05	6.20	6.78	7.68
Phila. (city)	7.15	7.05	8.25	6.35	...	6.30	7.11	8.90	6.15	6.30	7.40
Phila. (c'try)	6.90	6.80	8.00	6.10	...	6.05	6.86	8.65	5.90	6.05	7.15
Balt. (city)	5.80	7.04	8.27	6.24	...	6.24	7.09	...	6.34	6.00	7.64
Balt. (c'try)	5.60	6.84	8.07	6.04	...	6.04	6.89	...	6.14	5.80	7.44
Norfolk, Va.	6.50	...	...	6.70	...	6.55	7.70	...	6.60	6.50	8.00
Richmond, Va.	5.90	...	8.10	6.10	...	6.10	6.90	...	6.30	6.05	7.80
Wash. (w'hse)	6.02	7.26	8.49	6.46	...	6.46	7.26	...	6.56	6.22	7.86
Buffalo (del.)	5.80	6.60	8.29	6.06	...	5.80	6.65	10.65††[5]	6.00	6.25	7.55
Buffalo (w'hse)	5.60	6.40	8.09	5.86	...	5.60	6.45	10.45††[5]	5.80	6.05	7.35
Pitts. (w'hse)	5.60	6.40*	7.75	5.65-5.95	6.90	5.55	6.40	10.10††	5.70	5.75	7.00
Detroit (w'hse)	5.45-5.78	6.53-6.80	7.99	5.94-5.95	7.75	5.84	6.56	8.91	6.09	6.19-6.35	7.28
Cleveland (del.)	5.80	6.60	8.30	5.89	7.10	5.77	6.60-6.70	8.91	10.02	6.12	7.32
Cleve. (w'hse)	5.60	6.40	8.10	5.69	6.90	5.57	6.40-6.50	8.71	5.82	5.92	7.12
Cincin. (city)	6.02	6.59	7.34	5.95	...	5.95	6.51	...	6.24	6.34	7.50
Chicago (city)	5.80	6.60	7.95	5.75	...	5.75	6.50	10.30	5.90	6.00	7.20
Chicago (w'hse)	5.60	6.40	7.75	5.55	...	5.55	6.30	10.10	5.70	5.80	7.00
Milwaukee (city)	5.94	6.74	8.09	5.89	...	5.89	6.74	10.44	6.04	6.14	7.34
Milwau. (c'try)	5.74	6.54	7.89	5.69	...	5.69	6.54	10.24	5.84	5.94	7.14
St. Louis (del.)	6.05	6.85	8.20	6.00	...	6.00	6.85	10.55	6.23	6.33	7.53
St. L. (w'hse)	5.85	6.65	8.00	5.80	...	5.80	6.65	10.35	6.03	6.13	7.33
Kans. City (city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
Kans. City (w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Omaha, Nebr.	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Birm'hm (city)	5.75	6.55	6.90[3]	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm, (w'hse)	5.60	6.40	6.75[3]	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.55	8.10	9.05[5]	6.60	8.90	6.55	7.75	...	6.55	6.60	9.20
L. A. (w'hse)	6.35	7.90	8.85[5]	6.40	8.70	6.35	7.55	...	6.35	6.40	8.70
San Francisco	6.65	7.80[4]	8.90[5]	6.60	...	6.45	8.20	...	6.45	6.50	8.60
Seattle-Tacoma	7.05	8.60[3]	9.20[3]	7.30	...	6.75	9.10	11.15	6.65	6.75	8.80

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded; ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [4]3500 lb and over; [5]—1000 to 1999 lb.

ORES

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports. After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit, del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$38-$39
Domestic scheelite, del.	nominal

Manganese Ore

Indian manganese, 46-48%, nearby, 92.00-96.00c per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 79.8-81.8c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00

South African Transvaal

44% no ratio	$27.00-28.00
45% no ratio	20.00
48% no ratio	34.00-35.00
50% no ratio	28.00-28.50

Brazilian

44% 2.5:1 lump	$32.00

Rhodesian

45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00

Domestic—rail nearest seller

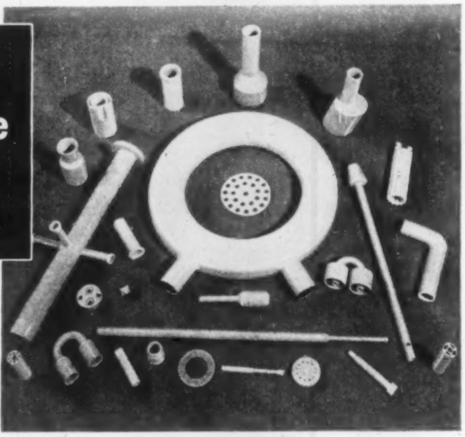
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molbdenum content, mines	$0.90

PRICES UNCHANGED

For current quotations on refractories, pipe, boiler tubes, stainless steels, clad steels, metal powders, bolts, nuts, rivets, washers, electrodes, coal chemicals, fluorspar ferroalloys and coke, refer to pages 146 and 147, STEEL, Apr. 9, 1951, issue.



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McDanel Refractory Porcelain Co.
Beaver Falls · · · Penna.

Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Forms Granco Steel Products

A fully-owned subsidiary of Granite City Steel Co., Granite City, Ill., was established for the manufacture of steel products. Granco Steel Products was formed to provide the parent company with an independent subsidiary to manufacture various construction and consumer products which generally are manufactured and sold through channels other than those supplied by Granite City Steel's sales outlets.

Major products now manufactured and sold by Granco Steel Products are COFAR and Corruform, construction industry specialties made from Granite City Steel's high-tensile tough-temper cold-rolled steel.

Officers of Granco, which was incorporated under the laws of Illinois, are: John N. Marshall, president; J. D. Streett, executive vice president; Bengt F. Friberg, vice president and general manager; W. F. Hoelscher, secretary-treasurer.

Skagit Steel Plans Expansion

Skagit Steel & Iron Works, Sedro Wooley, Wash., leased a Port of Bellingham site and building for plant expansion.

Westinghouse Builds Plant

Westinghouse Electric Corp., Pittsburgh, plans to construct an electronic tube manufacturing plant in Bath, N. Y. Automatic machinery is being constructed for this plant and will be available as soon as the building is completed. A similar plant is being constructed near Elmira, N. Y. If conditions permit, the Bath plant will be converted after the national emergency to produce tubes for radio receiving and television sets.

York Engineering Moves

York Engineering & Construction Co., Pittsburgh, moved its offices and engineering departments to larger quarters at 951 Penn Ave. This firm is a general engineering contractor and recently completed several large projects for steel mills located in various parts of the country.

Lubrication Equipment Agent

Aro Equipment Corp., Bryan, O., appointed Bruns & Collins Inc., Chicago, as direct factory distributor for lubrication equipment in the northern Illinois territory.

Plans Joint Bomber Project

Preliminary planning for production of the Boeing B-47 stratojet on a massive tri-company scale has been completed at Wichita, Kans., by officials of the Air Force, Boeing Airplane Co., Douglas Aircraft Co. and Lockheed Aircraft Corp. Under this program, Douglas and Lockheed will build the bomber at reactivated World War II plants, complementing the substantial stratojet production already under way at Boeing's Wichita division.

Aluminum & Brass Foundry

National Aluminum & Brass Foundry, Independence, Mo., plans construction of a foundry building for its plant in that city.

Sheet Metal Worker Moves

Materials Handling Co., Baltimore, sheet metal work, moved to 204 S. Chapel St. J. W. Graham is president.

GE Expands Research Center

Plans for construction of a $550,000 addition to General Electric Co.'s research laboratory at The Knolls, near Schenectady, N. Y., were disclosed. C. Guy Suits, vice president and research director of the company, said construction was approved by National Production Authority and will start within 30 days.

Enlarges Diesel Engine Plant

Austin Co., Cleveland, has the general contract for construction of a $2.5 million addition to the diesel engine manufacturing plant of Busch-Sulzer Bros. Engine Co., a division of Nordberg Mfg. Co., St. Louis.

Castle To Build in East

A. M. Castle & Co., Chicago, steel distributor, acquired four acres at Ashland and Kresson streets, Baltimore, where it will begin at once on the erection of a warehouse and office building. The branch plant will be in charge of Edward F. Schalk.

Shortages Delay Expansion

Weyerhaeuser Timber Co., St. Paul, has been granted a certificate of necessity for a proposed $19 million pulp plant in Everett, Wash. The project has not been started because of difficulty in placing orders for machinery and equipment.

Clary Gets Defense Work

Clary Multiplier Corp., Los Angeles, received a $2.1 million Navy contract for bearing reprocessing. Most of the work will be done at the Downington, Pa., plant. The company's backlog of defense work totals $7.5 million. At its San Gabriel, Calif., plant,

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GANG SLITTING KNIVES
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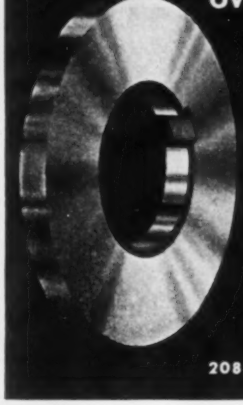

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ONE OF THE NATION'S
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PRODUCTION FOUNDRIES

*

ESTABLISHED 1866

THE WHELAND COMPANY

FOUNDRY DIVISION

MAIN OFFICE AND MANUFACTURING PLANTS
CHATTANOOGA 2, TENNESSEE

which is working on a $3 million ordnance contract, construction started on a 15,000 square foot addition.

Strip Maker Adds Facilities

General Coatings Corp., Los Angeles, added facilities for rolling and slitting of aluminum and steel strip. Widths up to 10½ inches and gages from 0.006 inch to 0.125 inch can be accommodated.

Times Facsimile Moves

Offices, laboratory and factory of Times Facsimile Corp. are now located at 540 W. 58th St., New York.

Douglas Aircraft Expands

Douglas Aircraft Co. Inc., Santa Monica, Calif., started construction of a $1.2 million building for parts fabrication. Backlog of the firm stands at $656 million.

Edmund Scientific Corp.

Edmund Salvage Co. changed its name to Edmund Scientific Corp. Its plant and executive offices remain at Barrington, N. J., under the same ownership and management.

Gavan-Graham Moves Plant

Gavan-Graham Electric Products Corp. moved its offices and plant to 65 Rome St., Newark 5, N. J.

Abrasive Firm To Expand

Plans for building a $200,000 office and warehouse building in Buffalo were announced by Minnesota Mining & Mfg. Co., St. Paul. F. Carl Swenson, office manager in that city for the abrasive and adhesive manufacturer, said the building will double the firm's distribution facilities in the area.

Cannon Simplifies Name

Cannon Electric Co. is the new name of Cannon Electric Development Co., a division of Cannon Mfg. Corp., 3209 Humboldt St., Los Angeles 31. Leslie Baird is now advertising manager for Cannon Electric.

$10 Million Order Placed

Rheem Mfg. Co., Los Angeles, was awarded Ordnance Department artillery ammunition contracts totaling $10 million. C. V. Coons, vice-president, says work will start immediately on the contracts at the firm's New Orleans plant. The plant produced similar ammunition in World War II.

Kaiser Reactivating Plant

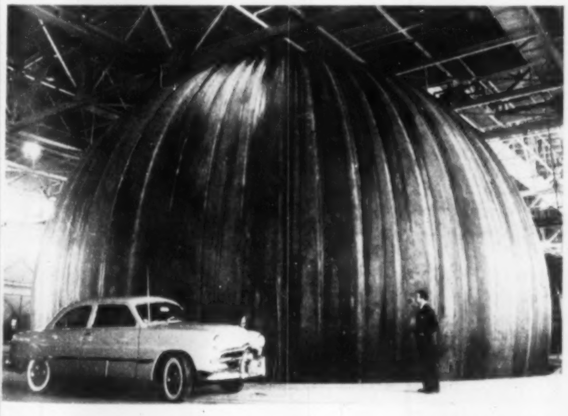
The plant recently obtained from the government under a 5-year lease by Kaiser Aluminum & Chemical Corp., Halethorpe, Md., is expected to be in full operation by the end of May. Marvin L. Lee is local manager.

Rochester Warehouse Sold

Inland Steel Products Co.'s warehouse in Rochester, N. Y., was purchased by S. B. Spear Co. Inc. for $300,000. Inland's Rochester warehouse activities are to be consolidated with those of its Buffalo warehouse.

Vibrator Firm Still Growing

Marking the third expansion in five years for Cleveland Vibrator Co., Cleveland, is the completion of another addition to the company's plant. It will house new automatic screw machines for vibrator production. The company also streamlined its shipping room



EAR MUFF: Standing like a giant watermelon half is this radar-dome made by B. F. Goodrich Co., Akron. The house protects delicate radar equipment needed to warn of approaching enemy aircraft. It stands 37 feet high and has a diameter of 54 feet. Thin walls of specially compounded rubber and glass fiber are inflated to less than one pound pressure

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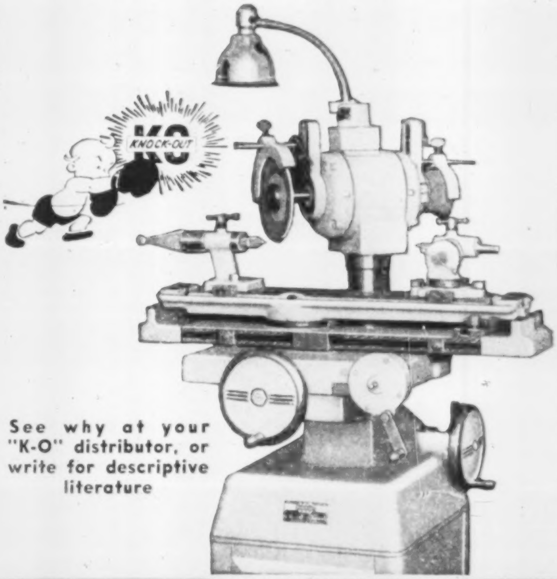

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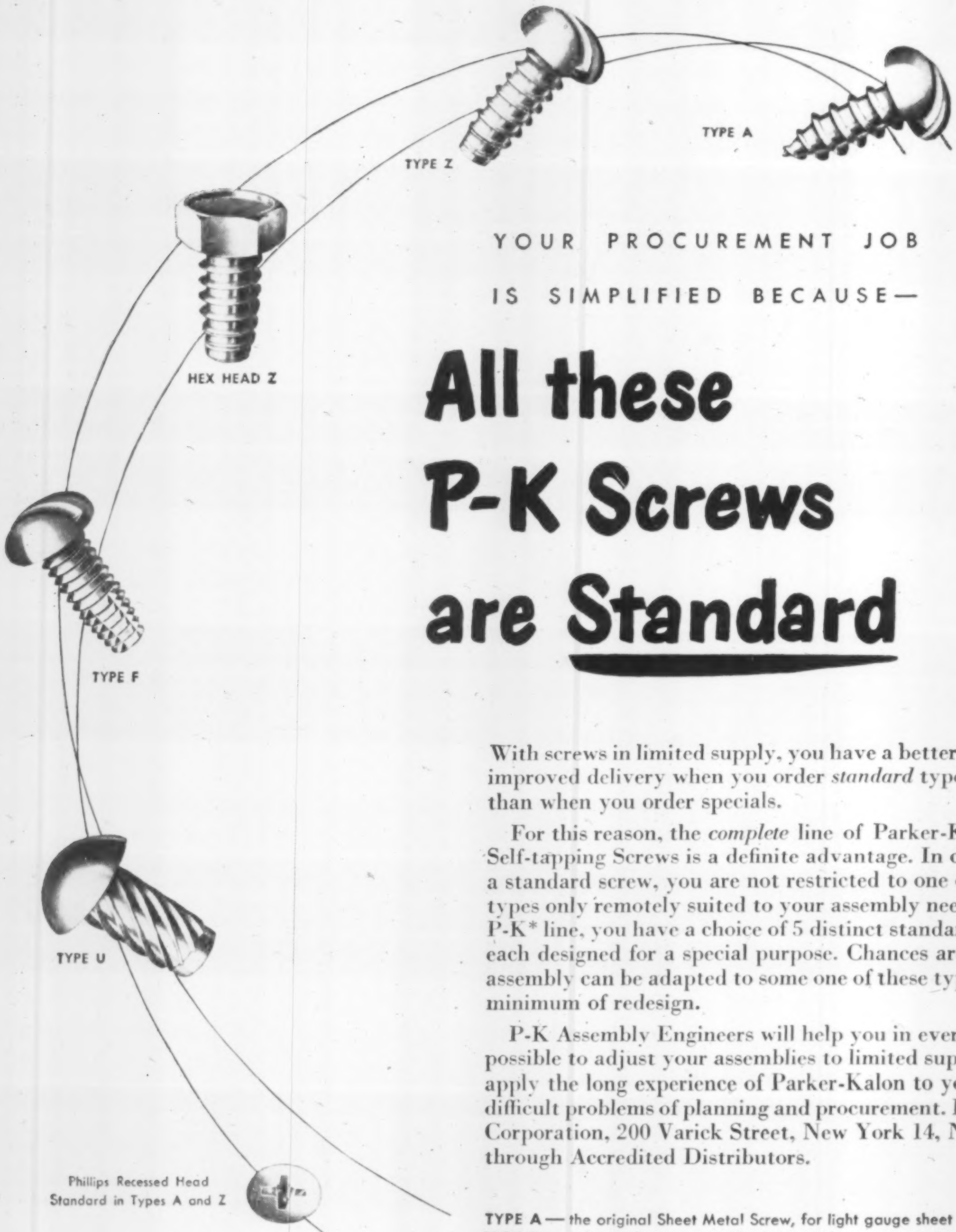
STAMPINGS IN SMALL LOTS
Lowest possible die cost
DAYTON ROGERS MFG. CO.
Minneapolis 7, Minnesota



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For this reason, the *complete* line of Parker-Kalon Self-tapping Screws is a definite advantage. In changing to a standard screw, you are not restricted to one or two types only remotely suited to your assembly needs. In the P-K* line, you have a choice of 5 distinct standard types, each designed for a special purpose. Chances are your assembly can be adapted to some one of these types with a minimum of redesign.

P-K Assembly Engineers will help you in every way possible to adjust your assemblies to limited supplies, and apply the long experience of Parker-Kalon to your most difficult problems of planning and procurement. Parker-Kalon Corporation, 200 Varick Street, New York 14, N. Y. Sold through Accredited Distributors.

TYPE A— the original Sheet Metal Screw, for light gauge sheet metal. **TYPE Z**— a thread-forming screw for light and heavy gauge sheet metal, non-ferrous castings, plastics, etc. Also made with **HEX HEAD**, suitable in heavier sizes for structural steel. **TYPE F**— cuts standard machine screw thread as it is driven. For ferrous and non-ferrous castings, light and heavy sheet metal, plastics, etc. **TYPE U**— Drive Screw for making permanent fastenings to ferrous and non-ferrous castings, plastics, etc.

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The Original
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A TYPE AND SIZE FOR EVERY METAL AND PLASTIC ASSEMBLY and installed automatic spray painting facilities in a separate room.

Heater Firm Plans Addition

Ross Heater & Mfg. Co., Buffalo, is planning a $500,000 expansion program. Construction of a factory addition is under way and considerable production machinery will be installed. Defense work now comprises about 30 per cent of the plant's total production.

Machine Tool Maker Builds

Hardinge Bros. Inc., Elmira, N. Y., has begun a $500,000 expansion program to meet heavier demands for its machine tool products. Considerable new machinery and equipment will be installed in a plant addition.

Moves Antenna Mast Plant

Maryland Engineering Co. moved from Pikesville to a plant at 1401 Reistertown Rd., Baltimore, where it will manufacture radio antenna masts.

Ryan Aeronautical Builds

Ryan Aeronautical Co., San Diego, Calif., started building a new warehouse-hanger to provide additional facilities. Completion is scheduled in May. Ryan's backlog totals $25 million, chiefly for military aircraft components.

Expands Testing Facilities

United States Testing Co., Hoboken, N. J., moved its Los Angeles branch to 1723 S. Maple Ave. A considerable amount of new machinery will be installed in the new building.

Opens Cleveland Warehouse

Charles H. Besly & Co., Chicago, manufacturer of taps, drills and reamers, opened a warehouse and sales office at 6516 Detroit Ave., Cleveland, under direction of T. F. Mummery Jr.

Tank Maker Opens Plant

Harris Metal Tanks Inc. is opening a plant at Hubbard, O., taking over a building formerly occupied by Hubbard Automotive & Supply Co. The newly incorporated firm will make farm tanks and fuel tanks. The company is a subsidiary of Harris Fabricating Co., Youngstown, headed by Frank O. Harris.

Will Consolidate Facilities

Construction will be started soon on a building to be leased by American Cyanamid Co. in the Los Angeles central manufacturing district. It is being built under contract with John M. Stahl and Buttress & McClelland Inc. Among the units of the company which will use the new facilities are: Calco Chemical Division's pigment department and bulk pharmaceutical department; Industrial Chemicals Division; Plastics & Resins Division; Lederle Laboratories Division's branch office and regional sales office. Cyanamid's West Coast executive offices, now located at Azusa, Calif., also will be in the new building.

Opens Joint Chicago Office

Bryant Chucking Grinder Co., Fellows Gear Shaper Co. and Jones & Lamson Machine Co., all of Springfield, Vt., will open a new office and show room at 5835 W. North Ave., Chicago, to be occupied jointly by them, about June 1.

Reading Crane & Hoist Corp.

Reading Chain & Block Corp., Reading, Pa., changed its name to Reading Crane & Hoist Corp., effective June 1. The change does not affect the capital structure, personnel ownership or production of the company. Fred A. Howard is president; Philip K. Howard, vice president; Frank M. Howard, secretary-treasurer.

Goodrich To Widen Research

Additional facilities are being constructed in Brecksville, O., for B. F. Goodrich Co.'s research center. Construction will include additions to existing buildings which will be ready for occupancy in October.

Tapping Machine Agents

Cleveland Tapping Machine Co., Hartville, O., a subsidiary of Automatic Steel Products Inc., Canton, O., appointed the following dealers: McVoy-Hausman Co., North Birmingham, Ala.; Charles W. Stone Co., Minneapolis.

Brainard Awards Contract

Eichleay Corp., Pittsburgh, has been engaged to lay foundations, and relocate and perform mechanical installation of machinery and equipment at the new Warren, O., plant of Brainard Steel Co. The project includes moving of heavy equipment from the Farrell, Pa., and Orville, O., plants as well as from the old plant in Warren.

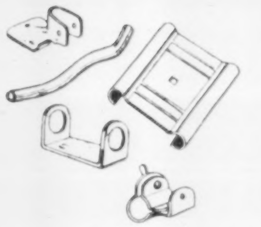
Price Associates To Move

J. R. Price Associates, mill representative, will move its office to larger quarters at 18 E. 41st St., New York, on May 1.

Firms Get Delaware Charters

O. J. Heinzmann Inc., Kinetics Corp., and Lane-Stark Co., all engaged in the machinery business, and Kimberling Metals & Refining Co. Inc., metallurgy, were chartered by the secretary of state's office, Dover, Del. Corporation Trust Co., Wilmington, Del., is serving as the principal office of these companies.

METAL *Fabricating*



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